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June 28, 2007

Mrs. Judith M. Katz  
Director, Air Protection Division  
US EPA Region III  
1650 Arch Street (3AP00)  
Philadelphia, PA 19103-2029

Dear Mrs. Katz:

The purpose of this letter is to formally transmit the June 30, 2007 status reports and supporting documents for the Early Action Compact areas of Roanoke and the Northern Shenandoah Valley to EPA Region III. This submission is in response to the requirements of the EAC program and EPA guidance on this subject.

These status reports clearly document the great amount of continuing effort and progress that has been made at both the local and state levels to meet all the commitments of the ozone early action plans for these areas. As a result of these plans, both areas are now in compliance with the 8-hour ozone standard.

Please contact me if you have any questions concerning these reports, and thank you again for your support throughout this successful air quality planning effort.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas R. Ballou", followed by a long horizontal flourish.

Thomas R. Ballou, Director  
Air Data Analysis and Planning

Enclosures



# Ozone Early Action Plan

## Northern Shenandoah Valley

June 30, 2007

Mr. James E. Sydnor, Director  
Air Division  
Virginia Department of Environmental Quality  
629 East Main Street, 8<sup>th</sup> Floor  
Richmond, VA 23219

**RE: Ozone Early Action Plan for Northern Shenandoah Valley  
June 2007 Progress Report Submittal to US EPA**

Dear Mr. Sydnor:

This submittal includes the 8<sup>th</sup> semi-annual Early Action Compact status report for The Northern Shenandoah Valley Region in the Commonwealth of Virginia. Per the May 7, 2007, communication received from Tom Ballou of the Virginia Department of Environmental Quality, the following elements are included:

Documentation of any progress from the period January 2007 – June 2007 includes:

- Major events and meetings that have taken place;
- Status of control measures that have already been implemented;
- Any impediments to implementation; and
- An updated summary chart depicting the status of the implemented control measures of the Northern Shenandoah Valley Early Action Compact Area.

What follows in the report is this brief introductory memo followed by actions taken to fulfill early action compact milestones during the period of January 2007 to June 2007.

The Winchester-Frederick County Economic Development Commission has administered and continues to administer the overall Ozone Early Action Plan (EAP) for the Northern Shenandoah Valley. If you have any questions regarding our submittal, please contact me at (540) 665-0973.

Sincerely,

Patrick Barker, AICP  
Executive Director



# **Ozone Early Action Plan**

## **Northern Shenandoah Valley**

*NOTE: U.S. EPA refers to the January-June, 2007 period as the 9th semi-annual progress reporting period in the Early Action Compact program.*

# **8<sup>th</sup> Semi-Annual Status Report**

## **for**

### **The Northern Shenandoah Valley**

### **Ozone Early Action Compact Area**

**June 30, 2007**



# Ozone Early Action Plan

## Northern Shenandoah Valley

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# I. Introduction

## Project Organization and Summary to Date

This report represents the 8<sup>th</sup> semi-annual status report for the Northern Shenandoah Valley (NSV) Early Action Compact Area in Virginia, which consists of the City of Winchester and Frederick County. As such, this report documents the status and progress made towards the development and implementation of an Early Action Plan (EAP) to address ground-level ozone air pollution in the area. Specifically, this report covers the period from January 1, 2007, to June 30, 2007.

The EAC process in the Northern Shenandoah Valley (NSV) area began in the fall of 2002, with the establishment of the NSV Air Quality Improvement Task Force and the formal development and signing of the Early Action Compact in December 2002. Moving forward, a series of required documents has been produced, culminating in the submission of the official EAP in March 2004. Provided below is a listing and timeline of the products and documents provided by the NSV EAC effort:

- **December 31, 2002** – Early Action Compact for the Northern Shenandoah Valley Area.
- **June 16, 2003** – Potential local control list submission.
- **June 30, 2003** – 1<sup>st</sup> Semi-Annual Status Report, January to June 2003.
- **December 31, 2003** – 2<sup>nd</sup> Semi-Annual Status Report, July to December 2003.
- **March 31, 2004** – Ozone Early Action Plan for the Northern Shenandoah Valley Area.
- **June 30, 2004** – 3<sup>rd</sup> Semi-Annual Status Report, January to June 2004.
- **December 31, 2004** – State Implementation Plan.
- **June 30, 2005** – 4<sup>th</sup> Semi-Annual Status Report, January to June 2005.
- **December 30, 2005** – 5<sup>th</sup> Semi-Annual Status Report.
- **June 30, 2006** – 6<sup>th</sup> Semi-Annual Status Report.
- **December 31, 2006** – 7<sup>th</sup> Semi-Annual Status Report.

All these documents, along with other information concerning the EAC program and other EAC areas, can be viewed at and retrieved from the following Web sites:

**EPA** - <http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm>

**Valley AIRNow** - <http://www.valleyairnow.com/Reports&Meetings.htm#Submittals>

Efforts on the state and local levels have now moved towards the maintenance and enforcement of the emissions control measures and other actions committed to in the EAP.

The remainder of this status report documents the major actions, milestones, and events that have occurred since the submission of the 7<sup>th</sup> Semi-Annual Status Report on December 31, 2006.

## Summary of Events (January to June 2007)

Provided below is a listing of major events held and actions taken during the period covered by this status report toward the implementation and maintenance of the local ozone air-quality improvement plan and associated non-attainment implications:



**January 14 - 18, 2007** – The 87<sup>th</sup> American Meteorological Society (AMS) Annual Meeting was held in San Antonio, Texas. SHENAIR attended the conference and presented a poster during the 16<sup>th</sup> Symposium on Education on Sunday, January 14<sup>th</sup>. The poster entitled “Utilizing GLOBE as an Inquiry-Based Teaching Strategy in the Shenandoah Valley” resulted from the SHENAIR-Valley AIRNow joint teaching workshop held in June 2006. Refer to Appendix B for poster abstract and additional information.

**January 24, 2007** – Valley AIRNow participated in a Mid-Atlantic Diesel Collaborative teleconference (Appendix C). A short, informational PowerPoint presentation was given to the Collaborative on the Clean Diesel Network—Valley AIRNow’s outreach initiative for the mobile freight industry.

**January 26, 2007** – Valley AIRNow participated in a Clean Air Champions Partners meeting hosted by the Virginia Department of Environmental Quality and American Lung Association of Virginia (ALAV) at the ALAV Headquarters in Richmond, Virginia. Valley AIRNow’s role in the evaluation phase of the Clean Air Champions program was discussed.

**February 1, 2007** – An informational article by Valley AIRNow is published in the Top of Virginia Regional Chamber’s *Business Agenda* (Appendix D).

**February 7, 2007** – The Northern Shenandoah Valley Air Improvement Task Force meeting was administered by Valley AIRNow.

**February 8, 2007** – Valley AIRNow attended an outreach meeting with Ms. Angela Neilan, Community Involvement Specialist for the Department of Environmental Quality’s Office of Environmental Education. Evaluation materials were provided for Valley AIRNow’s implementation of the Clean Air Champions program in the Northern Shenandoah Valley.

**February 11 - 14, 2007** – The U.S. EPA’s National Air Quality Conference was held in Orlando, Florida. Valley AIRNow attended the conference and participated in the “Communicating Air Quality and Communities in Motion” work sessions. On Monday, February 12<sup>th</sup>, Valley AIRNow presented a poster (Appendix E-12) entitled “A Proposed Method to Qualitatively and Quantitatively Evaluate the Effectiveness of K – 12 Air Quality Outreach Programs.” Refer to Appendix E for the conference agenda and additional poster information.

**February 21 - 22, 2007** – Valley AIRNow, in collaboration with the Department of Environmental Quality and American Lung Association of Virginia, presented the Clean Air Champions program to approximately 200 Drivers Education students at James Wood High School—a Frederick County public school. The presentation consisted of an introductory PowerPoint presentation and several hands-on activities including a tire pressure simulation and a tire pressure measurement outdoor activity. For more information, refer to Page 15 or Appendix F of this report.

**March 13, 2007** – Valley AIRNow met with approximately 12 Winchester-Frederick County day care centers regarding the possibility of installing idle reduction street signage (Appendix G-1) in parent pick-up/drop-off zones.

**March 13, 2007** – Valley AIRNow met with Mr. Larry Rickard, Buildings and Grounds Director of Frederick County Public Schools. The logistics of idle reduction sign installation at each school was discussed.

**April 4, 2007** – The Northern Shenandoah Valley Air Improvement Task Force meeting was administered by Valley AIRNow.

**April 4, 2007** – Valley AIRNow submitted prerecorded, Clean Air Champions public service announcements (Appendix F-27) to area broadcast media.

**March 23, 2007** – Valley AIRNow participated in a Commute Smart Virginia teleconference coordinated by the American Lung Association of Virginia.

**April 18, 2007** – SHENAIR and Valley AIRNow partnered with the Virginia Department of Environmental Quality to host an educational Earth Day event for area high school students at James Madison University. The theme of the outreach event was “Protecting the Earth’s Natural Resources.” Students circulated between four interactive stations, including Clean Air Champions, Science on a Sphere, vehicle emissions testing, and a tour of the city’s Resource Recovery facility. Refer to Appendix H for additional information on this Earth Day event.

**April 20, 2007** – The Virginia Department of Transportation (VDOT) distributed a memorandum regarding ozone alert procedures to all VDOT districts. The memo (Appendix I-1) outlined VDOT actions on Air Quality Action Days (AQAD), including travel reduction, fueling restrictions, and the use of changeable message signs (CMS).

**April 20, 2007** – The Virginia Department of Transportation (VDOT) distributed a memorandum to VDOT Transportation Officers regarding gasoline restrictions for Code Red “Air Quality Action Days”. The memo (Appendix I-4) outlined the hours of operation of VDOT fueling facilities on pending Code Red Action Days.

**April 21, 2007** – The City of Winchester Parks & Recreation sponsored an Earth Day event at Jim Barnett Park to promote the conservation of energy and natural resources (Appendix L-20). During the day, area groups and organizations staffed informational booths for the public, a community park clean-up was organized, and interpretive walks were held at the Abrams Creek Wetland Preserve and Audubon Arboretum.

**April 27, 2007** – Frederick County distributed an Air Quality Action Day (AQAD) memorandum to all county departments. The memo (Appendix J) outlined the recommended local government actions on pending Air Quality Action Days such as the postponement of mowing and restriction of engine idling.

**April 30 - May 4, 2007** – The Environmental Protection Agency (EPA) and National Oceanic and Atmospheric Administration (NOAA) partnered to host the 2007 Air Quality Awareness Week. SHENAIR and Valley AIRNow air quality events were posted to the Air Quality Awareness Week web site at <http://www.epa.gov/airnow/airaware/local.html>. Refer to Appendix K for more information.

**May 1, 2007** – Valley AIRNow disseminated a press release (Appendix L) to Winchester-Frederick County news media announcing the onset of ozone season and highlighting the steps that community members could take to reduce individual, ozone-inducing emissions.

**May 1, 2007** – Valley AIRNow distributed approximately 25 ozone season media kits to television, print, and broadcast news media in the Winchester-Frederick County area. Each media kit contained informational pamphlets on Valley AIRNow, ground-level ozone, and the air quality index, as well as selected chapters from the EPA Ozone Media Kit.

**May 1, 2007** – The American Lung Association releases its 2007 State of the Air report to the public. According to the report, Winchester-Frederick County’s ground-level ozone grade improved from an F to a B. The improvement resulted in several major news outlets in the area covering the story. For news coverage, refer to Appendix L-12 and L-14. For selected sections of the State of the Air report, refer to Appendix L-34.

**May 4 - 5, 2007** – The Shenandoah Apple Blossom Festival Kids Bloomin' Mile and adult 10K races (Appendix M-1) were held. Valley AIRNow placed a custom informational ozone bookmark (Appendix M-2) in 1,800 Runner's Packets.

**May 8, 2007** – The Northern Shenandoah Valley Air Improvement Task Force meeting was administered by Valley AIRNow.

**June 6, 2007** – The Northern Shenandoah Valley Air Improvement Task Force meeting was administered by Valley AIRNow.

**June 25 - 29, 2007** – SHENAIR and Valley AIRNow held a summer workshop for Shenandoah Valley teachers on the campus of James Madison University. The workshop consisted of three mini-workshops featuring GLOBE (Global Learning and Observations to Benefit the Environment) protocols, Geographic Information Systems (GIS) instruction, and Science on a Sphere dataset visualizations. The workshop was open to teachers in science and other related fields (e.g., environmental science, ecology) of grades 4 – 12. Continuing education credits were awarded following completion of each mini-workshop. Valley AIRNow's outreach coordinator, Ms. Tiffany Tumer, served as the instructor for the GLOBE surface ozone protocol.

For more information on the teacher workshop, refer to page 19 or Appendix N.

## **II. Implementation Status of Early Action Control Measures**

This section describes the status of each emission-control measure included in the early action plan. Appendix A includes a tabular summary of each emission-control measure, implementation dates, emissions reductions, and applicable resources.

### **Local Phase I Controls**

The Phase I strategies were implemented as of December 2005 and have since been upheld, maintained, and enforced. These measures have the greatest public acceptance and will provide an important foundation for continued future efforts.

#### **1. Ozone Action Days/Public Awareness**

Valley AIRNow is an education and outreach program supported financially by the localities of Winchester City and Frederick County and by the SHENAIR Institute at James Madison University. The SHENAIR Institute operates Valley AIRNow under the advice and consent of the Task Force. Valley AIRNow staff primarily conducts activities falling under this control measure.

Control Strategies:

#### **General Public Awareness Program/Education and Promotion Campaign**

*Valley AIRNow Air Quality Hotline: Active 2007*

The air quality hotline provides daily air quality forecasts during ozone season, information about how to contact Valley AIRNow, and messaging-service capabilities. The hotline number is (540) 450-2207. During the off season (October – April), the hotline is operable only in its messaging-service capabilities. Although the forecasting service is suspended during this time,

the hotline continues to provide the community with a message center to voice any questions or concerns.

*Valley AIRNow Email System: Active 2007*

The community can contact Valley AIRNow via email at: [info@valleyairnow.com](mailto:info@valleyairnow.com). The system is checked for messages every weekday, and responses are returned promptly within one business day or less.

*Valley AIRNow Web site: Ongoing 2007*

The Valley AIRNow web site can be accessed at: [www.valleyairnow.com](http://www.valleyairnow.com). Air quality information is added on a weekly basis to keep local residents informed of the most current and up-to-date news on ground-level ozone. In addition, the community can stay informed of recent and upcoming Valley AIRNow events by visiting the “News & Updates” page at <http://www.valleyairnow.com/newsandupdates.html>. Photographs from these events are made available to the public at <http://www.valleyairnow.com/pictures.htm>. Other staples of the Valley AIRNow Web site include: Task Force meeting materials, EPA submittals, congestion and haze web cameras, and a local air quality Media Center.

The newest informational feature to the Valley AIRNow Web site is Air Update—an online tool developed by Sonoma Technology that allows registered organizations to display Air Quality Index forecasts on their web sites (Figure 1). For the Winchester-Frederick County area, the Air Update console automatically updates with the most current air quality forecast based on data from the Virginia Department of Environmental Quality.



Figure 1: Air Update console for Winchester, VA can be found at [www.valleyairnow.com](http://www.valleyairnow.com)

Valley AIRNow also continues to partner with the Federal Highway Administration's *It All Adds Up to Cleaner Air* initiative to make seasonal air quality web content available at [www.valleyairnow.com](http://www.valleyairnow.com). This content can be inserted into the Valley AIRNow Web site for free at [http://www.italladdsup.gov/community\\_partners/dc\\_readytogo\\_03.asp](http://www.italladdsup.gov/community_partners/dc_readytogo_03.asp) and viewed by clicking the “What Can We Do” tab or by pasting <http://www.valleyairnow.com/whatcanwedo.html> into a web browser.

*News Coverage (PRINT): Ongoing 2007*

The *Winchester Star* and *Northern Virginia Daily* have published several articles related to Valley AIRNow events, transportation, land use, green space preservation, and air quality issues in the area (Appendix L).

- January 4, 2007: Green Circle photograph, “Hiking and Biking Path” (Appendix L-1).
- January 18, 2007: “105 Acres Recommended for Residential and Commercial Use Rezoning” (highlighted text, Appendix L-2).
- January 26, 2007: “Frederick Panel Sets its Priorities: UDA Study key concern for DRRS” (Appendix L-4).



- March 1, 2007: "Frederick OKs New Design Concept" (Appendix L-6).
- March 6, 2007: "Frederick is Implementing UDA Changes" (Appendix L-8).
- March 27, 2007: "Plant a Tree or Shrub to Help Create Buffer" (Appendix L-10).
- May 1, 2007: "American Lung Association Report Lauds Valley" (Appendix L-12).
- May 2, 2007: "Data: Local Air Quality Sees an Improvement" (Appendix L-14).
- May 12, 2007: "Transportation Bill Targets 'New Urbanism': Preserving rural areas and green space are among goals state legislation is trying to reach" (Appendix L-16).
- May 23, 2007: "County Changes the Big Picture: Comprehensive Plan sees major work in 2 areas" (Appendix L-18).
- April 19, 2007: "Appreciate Natural Heritage at Earth Day Events" (Appendix L-20).
- April 19, 2007: "Frederick Could Look at VA Program on Easements" (Appendix L-22).
- April 26, 2007: "Housing, Business Project Advances" (Appendix L-24).
- April 27, 2007: "Development Group Advises Guidelines for Future Projects" (Appendix L-26).
- April 27, 2007: "Crosspointe Paves Way for Road, Fiscal Improvements" (Appendix L-28).
- June 5, 2007: "Frederick Board Favors Mixed Use in High-Density Zones" (Appendix L-30).

Other related articles and press releases from various media resources, include

- February 1, 2007: Valley AIRNow informational article, Top of Virginia Regional Chamber *Business Agenda*, Volume 21, No. 1 (Appendix D).
- April 17, 2007: "Public Invited to Free Emissions Test at JMU" (Daily News-Record; Appendix L-32).
- April 17, 2007: "Public Invited to Free Emissions Test Wednesday at James Madison University" (JMU Press Release; Appendix L-33).
- May 1, 2007: "State of the Air: 2007" (*American Lung Association*; see Appendix L-34 for selected sections relevant to Frederick County, Virginia).
- May 1, 2007: "Summer Ozone Season Begins May 1" (Valley AIRNow Press Release; Appendix L-43).
- June 1, 2007: "DEQ announces subscription-based air quality forecasts/health alerts by email" (VDEQ Press Release; Appendix L-45).

#### *News Coverage (RADIO): May 2, 2007*

WINC-FM, a popular radio station serving the Winchester-Frederick County area, interviewed Dan Salkovitz of the Virginia Department of Environmental Quality regarding the onset of the 2007 ozone season.

#### *Public Service Announcements (RADIO): April 2007*

In April Valley AIRNow released a 60-second, prerecorded public service announcement to several popular radio stations broadcasting to the Winchester-Frederick County area. This resulted from a partnership between Valley AIRNow, the American Lung Association of Virginia and the Department of Environmental Quality's Office of Environmental Education through its Clean Air Champions program. The announcement was released during the evaluation phase of Clean Air Champions to promote proper tire maintenance. The text of this public service announcement can be found in Appendix F-27.

#### *Air Quality Action Day Program: Maintained and Promoted 2007*

The Air Quality Action Day Program (AQAD) is a five-dimension network created by Valley AIRNow in 2005. The five separate groups in this network that are alerted of an Air Quality Action Day are business (via the Valley AIRCorps program), education, government, health, and media. If enacted, the Air Quality Action Day Program protocol is as follows. When the Virginia Department of Environmental Quality forecasts ozone levels for the next day to reach the Code Orange level or higher, the Valley AIRNow team alerts the AQAD Network by sending an email

or fax press release. The community and general public are then alerted mainly through the media, business, and health dimensions. Local newspapers run stories, while area radio stations run public service announcements. Businesses, health-care providers, and local government offices share the alert with all employees and—if applicable—customers, by displaying informative posters in high-visibility areas, offering incentives for participation in emissions-reduction activities, displaying the AQAD Alert on their message boards, etc.

A sixth dimension of the AQAD Network has recently been added for area members of the mobile freight industry. This dimension is referred to as the Clean Diesel Network (CDN) and applies to fleets, truck stops, and rest areas within the Winchester-Frederick County area. By enrolling in the CDN, members agree to educate employees and/or customers of better engine management practices (i.e., reduced idling), particularly on Action Days.

*Expanded Ozone Forecasting (INTERNET): Ozone Season 2007*

Winchester City and Frederick County air quality forecasts are made available through several notification systems—the American Lung Association’s (ALA) Smog Alert system and the Virginia Department of Environmental Quality’s newest communication tool, *DEQcast—Info on Demand*. DEQcast is a subscription-only service to receive DEQ air quality forecasts and/or health alerts via email. For more information on this tool, refer to Appendix L-45 for the official DEQ press release. Links for the general public to join the ALA or VDEQ notification systems are available year-round at the Valley AIRNow web site by following our “Current Air Quality” navigation bar ([www.valleyairnow.com/currentairquality.html](http://www.valleyairnow.com/currentairquality.html)).

Winchester-Frederick County residents are also given the option to contact the Valley AIRNow team at [info@valleyairnow.com](mailto:info@valleyairnow.com) to join our Air Quality Action Day email distribution list and receive alerts on Code Orange days or higher.

In addition, real-time ozone data for Winchester-Frederick County are available during ozone season from the sources listed below. Updated links and information to these sources can be found on the Valley AIRNow Web site at [www.valleyairnow.com/currentairquality.html](http://www.valleyairnow.com/currentairquality.html).

- Hourly ozone levels measured daily from the Frederick County ozone monitor – VA DEQ: [www.deq.virginia.gov/airquality/510690010.html](http://www.deq.virginia.gov/airquality/510690010.html).
- Current air-quality conditions for Virginia and two-day forecasts by region – VA DEQ: [www.deq.virginia.gov/airquality](http://www.deq.virginia.gov/airquality).
- Current air-quality conditions and one-day forecast for Winchester – EPA AIRNow: <http://cfpub.epa.gov/airnow/index.cfm?action=airnow.showlocal&cityid=376>.
- Animated regional ozone map for Virginia and North Carolina – EPA AIRNow: [www.airnow.gov/index.cfm?action=airnow.showmap](http://www.airnow.gov/index.cfm?action=airnow.showmap). Visitors must follow the links for local air quality to view an AQI map for Virginia/North Carolina (Figure 2 below).

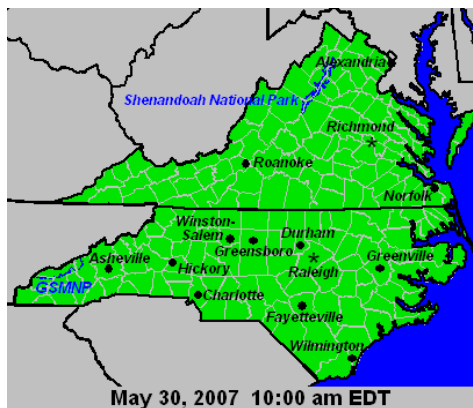
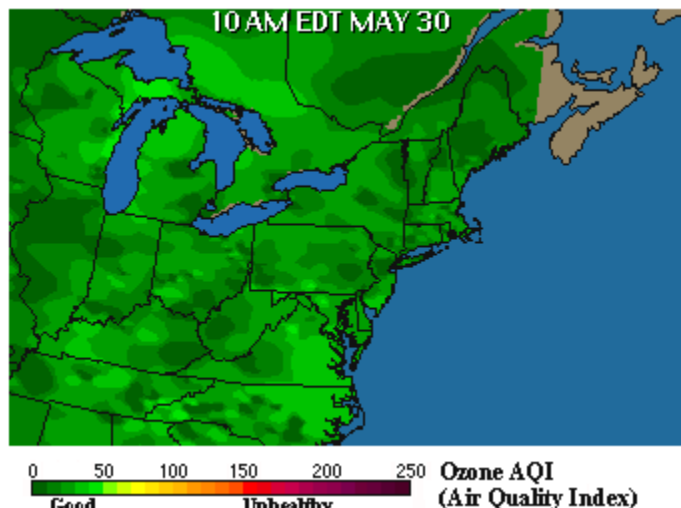


Figure 2: EPA AIRNow animated regional ozone map is linked to the Valley AIRNow web page

- Current air-quality conditions and one-day forecast for the Mid-Atlantic Region, including Winchester – The Weather Channel: [www.weather.com/outlook/health/airquality/?state=VA&from=36hr\\_outlet\\_ag](http://www.weather.com/outlook/health/airquality/?state=VA&from=36hr_outlet_ag).
- Current air-quality conditions and four-day forecasts for Winchester – Weather Underground: <http://www.wunderground.com/US/VA/Winchester.html>.
- Regional (Northeast) current air-quality map – Weather Underground: <http://www.wunderground.com/US/Region/Northeast/AirQuality.html>.



**Figure 3: Weather Underground animated regional ozone map is linked to the Valley AIRNow web page**

- Air-quality hotline for Winchester-Frederick County – Valley AIRNow: (540) 450-2207.
- Air-quality hotline – VA DEQ: (804) 698-4444.

The newest tool to provide real-time data on the Valley AIRNow Web site is Air Update—an online tool developed by Sonoma Technology that allows registered organizations to display Air Quality Index forecasts on their web sites (Figure 1). For the Winchester-Frederick County area, the Air Update console automatically updates with the most current air quality forecast based on data from the Virginia Department of Environmental Quality.

*Expanded Ozone Forecasting (TELEVISION): Ozone Season 2007*

TV-3 Winchester—an ABC affiliate serving the Winchester-Frederick County area—was launched in March 2007. Valley AIRNow recently partnered with TV-3's primary weathercaster, Ms. Lauryn Ricketts, to provide alerts to the community on pending Air Quality Action Days. For more information on TV-3 Winchester, visit [www.tv3winchester.com](http://www.tv3winchester.com).

On WAZT-TV, a Christian television network serving the entire Shenandoah Valley, ozone forecasts for Winchester-Frederick County are integrated into a local cutaway that airs five evenings a week during a program entitled "CBN Newscast". Additionally, The Weather Channel continues to display the words "Valley AIRNow Air Quality Outreach Program" on their "Local on the 8's" segment in the case of a forecasted Action Day.

*Expanded Ozone Forecasting (PRINT): Ozone Season 2007*

*The Winchester Star*, a popular local newspaper, publishes air quality forecasts and information in their daily edition.

*Materials Development, Adaptation, and Revision: Ongoing 2007*

Valley AIRNow will continue to adapt and revise existing air quality materials as needed for Winchester-Frederick County businesses, government, schools, media resources, health-care



providers, and community members. This includes Valley AIRNow posters, brochures, memorandums, public service announcements, as well as air quality curricula for both public and private schools.

In addition to existing materials, new air quality materials will be developed on an ongoing basis. Recent material development for 2007 includes:

For media: 2007 ozone season media kits were developed that contained the following basic materials: Valley AIRNow Air Quality Action Day and AIRCorps brochures, informational EPA ozone brochures, American Lung Association pamphlets, Air Quality Index guides, a sample air quality forecasting press release, selected chapters from the EPA Ozone Media Kit ([http://airnow.gov/index.cfm?action=mediakits\\_ozone.main](http://airnow.gov/index.cfm?action=mediakits_ozone.main)), and an air quality novelty item. Other resource-specific materials were included in kits for meteorologists and news reporters. These media kits were distributed on May 1<sup>st</sup>, 2007 to approximately 25 news media contacts.

Additionally, a letter endorsed by the Top of Virginia Regional Chamber of Commerce was created last fall to promote and recruit for the Valley AIRCorps program. This letter continues to be faxed during the 2007 ozone season to all Chamber business members.

For schools: In June, an informational flyer advertising a summer teacher training workshop at James Madison University was created and distributed to Winchester City and Frederick County teachers (Appendix N). The workshop features mini-workshops on GLOBE (Global Learning and Observations to Benefit the Environment) surface ozone protocols, Geographic Information Systems (GIS) instruction, and Science on a Sphere dataset visualizations.

In addition, signage was printed by a local vendor for the School Idle-Reduction program that was developed last fall. The idle reduction signs (Appendix G-1) are metal and 12" x 18" in dimension. Valley AIRNow has partnered with several public and private school districts in the area to display the signs in parent pick-up zones. Refer to page 17 for more information on this program.

In partnership with the Clean Air Champions program evaluation phase (Page 15), Valley AIRNow provided six James Wood High School Drivers Education classes, totaling approximately 300 students, with tire pressure gauges customized with the Valley AIRNow logo and web site. Using the gauges, students were educated on the relationship between proper car maintenance (i.e., proper tire inflation) and air pollution.

For general public: Educational Valley AIRNow bookmarks (Appendix M-2) were inserted in approximately 1,800 runner's packets, which were handed out to all participants in the Apple Blossom Festival Kids Bloomin' Mile and adult 10K races. The purpose of these bookmarks was to highlight the adverse health effects associated with ground-level ozone on runners.

For business and health: In April, signage was printed by a local vendor for the community Idle-Reduction program that was developed last fall. The idle reduction signs (Appendix G-1) are metal and 12" x 18" in dimension, mounted on either u-channel posts or the sides of buildings. Valley AIRNow has partnered with several local petroleum companies, day care centers, and the Virginia Inland Port to display the signs in areas experiencing high engine idling times. Refer to page 21 for more information on this program.

Since 2005, Valley AIRNow has partnered with the Top of Virginia Regional Chamber of Commerce (formally the Winchester-Frederick County Chamber) to submit informational air quality articles for inclusion in the monthly *Business Agenda*. Eighteen hundred copies of this business newsletter are printed and mailed to key community business leaders and distributed at high traffic locations in the area every month.

The following articles were written and submitted by Valley AIRNow to the Top of Virginia Regional Chamber *Business Agenda* this year:

### January 2007

“Have you made *your* New Year’s resolution yet? How about adding one to your list that is easy to achieve, saves money, and improves your health? Try making a vow to improve the quality of life for your family, friends, and community by preserving the air that we breathe! Simply choose from the **air resolutions** listed below. By fitting even *one* of these tips into your busy lifestyle, you will reduce harmful emissions, breathe easier, and save money at the pump!

- Trip Chain.
- Check your tire pressure regularly.
- Carpool.
- Don’t top off the tank.
- Limit engine idling.
- Keep your car well tuned.
- Refuel your car in the evening.
- Take public transit when possible.
- Avoid consumer spray products.
- Utilize area walking and biking paths.”

### April 2007

“Spring cleaning applies to more than just your house—spring is the time to make sure your car is tuned up and in working order. Regular car maintenance saves you time and money, while also helping to clean the air!

Just think...a little car maintenance now can prevent a lot of problems down the road. April, National Car Care Month, is a good time to start a year-round commitment to proper vehicle maintenance. Taking the time for a spring tune-up can extend the life of your car, reduce your chance of having a breakdown, consume less gasoline, and save money. Visit [www.valleyairnow.com](http://www.valleyairnow.com) for more information.”

### May 2007

“Now that spring has arrived, maybe you’re thinking about getting back into shape. What about your car? It’s the perfect season to consider your car’s health—and the air. It’s a fact: regular car maintenance improves gas mileage and performance, which helps reduce air pollution.

Here are some car maintenance facts to consider this spring:

- Regular car maintenance (tune-ups, oil changes, air filter maintenance, proper tire inflation) can save 23 gallons of gasoline/year.
- Replacing a dirty air filter can improve gas mileage by 10%—saving up to 55 gallons of gasoline, or about three trips to the gas station, each year.
- Keeping your tires inflated to the proper pressure can improve gas mileage by 3%—saving 18 gallons of gasoline/year.
- A well-maintained vehicle produces 20% less volatile organic compounds (VOCs) and 10% less nitrogen oxides (NO<sub>x</sub>)—the precursors of ground-level ozone—than a poorly maintained vehicle.”

In lieu of these time-specific articles, Valley AIRNow recently created a variety of generic informational and promotional advertisements for inclusion in the *Business Agenda*. These ads promote the Valley AIRNow outreach and business AIRCorps programs, as well as educate readers on the Air Quality Index and the steps individuals can take to reduce their emissions

while saving money (e.g., proper tire inflation and regular car maintenance). Refer to Figure 4 below to view the draft ads.

### Clean Air and Blue Skies are Valley Hallmarks



PLEASE help us keep it that way! Do your share to preserve our air

valleyairnow.com **valleyairnow**

### Promote your business for FREE



Become a Valley AIRCorps partner. Show the community that your business cares about public health and the environment and we will promote your business for free. Find out how.

*Do your share to preserve our air*

**AIRCorps**

visit valleyairnow.com

### \$imple choices can save you money

Did you know... By keeping your car tuned and properly inflating your tires, you burn less gasoline? By burning less gasoline you are reducing air pollution. So please, save some green and keep our air clean!



**valleyairnow**

visit valleyairnow.com

### Get to know the color of your air

Air Quality Index (AQI) for Ozone

GREEN	– Good (0-50)
YELLOW	– Moderate (51-100)
ORANGE	– Unhealthy for Sensitive Groups (101-150)
RED	– Unhealthy (151-200)
PURPLE	– Very Unhealthy (201-300)

Aim for green to keep our region's air clean. Get your daily Air Quality Forecast and find out the color of your air.

**valleyairnow**

visit valleyairnow.com

Figure 4: Generic informational and promotional ads developed by Valley AIRNow for the Top of Virginia Regional Chamber *Business Agenda*

### *Conferences and Presentations: Ongoing 2007*

Valley AIRNow began seeking out and presenting to various groups, organizations, and conferences in 2006. These presentations, along with a brief description of each, are listed below.

- January 14 – 18, 2007: The 87<sup>th</sup> American Meteorological Society (AMS) Annual Meeting was held in San Antonio, Texas. SHENAIR attended the conference and presented a poster during the 16<sup>th</sup> Symposium on Education on Sunday, January 14<sup>th</sup>. The poster entitled “Utilizing GLOBE as an Inquiry-Based Teaching Strategy in the Shenandoah Valley” resulted from the SHENAIR-Valley AIRNow joint teaching workshop (“Climate and Air Quality in the Shenandoah Valley”) held in June 2006.

The purpose of the poster was to demonstrate how Valley teachers attending the workshop planned to introduce GLOBE (Global Learning and Observations to Benefit the Environment) surface ozone protocols and hands-on air quality instruction into their school's science curricula. Implementation Case #3 was written by Ms. Janel Pidgeon—a Frederick County Public Schools teacher at the Northwestern Regional Educational Programs (NREP). NREP provides academic instruction and behavioral programming for school-age students who are identified as Emotionally Disturbed. Ms. Pidgeon's plan for surface ozone GLOBE implementation is included below and can be viewed in Appendix B-7:

“The students have emotional disabilities, and many are additionally identified as students with learning disabilities, so traditional learning modalities often do not succeed for these students. The opportunity for hands-on and real-life application of weather and air quality monitoring could spur the students on toward more involvement in the curriculum, as well as lead to better understanding of the curriculum. The students are all members of an important subgroup for Standards of Learning, and every little edge students receive can make a big difference district-wide. With real-world data, students can make connections between the content of their courses and the news and issues that surround them in the community.”

Refer to Appendix B for AMS poster abstract and additional information.

- January 24, 2007: Valley AIRNow participated in a Mid-Atlantic Diesel Collaborative teleconference (Appendix C). A short, informational PowerPoint presentation was given to the Collaborative on the Clean Diesel Network—Valley AIRNow's outreach initiative for the mobile freight industry.
- February 11 - 14, 2007: The 2007 U.S. EPA's National Air Quality Conference was held in Orlando, Florida. Valley AIRNow attended the conference and participated in the “Communicating Air Quality and Communities in Motion” work sessions. On Monday, February 12<sup>th</sup>, Valley AIRNow presented a poster (Appendix E-12) entitled “A Proposed Method to Qualitatively and Quantitatively Evaluate the Effectiveness of K – 12 Air Quality Outreach Programs.”

The topic of the poster presentation resulted from a 2005 Valley AIRNow survey of air quality programs across the United States, which revealed that a majority of programs rely primarily on the completion of short-term, qualitative milestones as indicators of the effectiveness of that outreach. Quantitative assessment of the effectiveness of outreach, particularly as it relates to grades K-12, was not reported in any of the surveys. Consequently, Valley AIRNow piloted a method that both qualitatively and quantitatively assessed the effectiveness of its K-12 outreach program. In particular, the outreach provided at the Air Quality Station on National Alternative Fuel Vehicle Day



Odyssey in the fall of 2006, was analyzed. Refer to Appendix E for the Valley AIRNow poster, conference agenda, and additional information.

- February 21 - 22, 2007: Valley AIRNow, in collaboration with the Department of Environmental Quality and American Lung Association of Virginia, presented the Clean Air Champions program to approximately 200 Drivers Education students at James Wood High School—a Frederick County public school. The presentation consisted of an introductory PowerPoint presentation and several hands-on activities, including a tire pressure simulation and tire pressure measurement outdoor activity. Each student was provided with a customized Valley AIRNow tire pressure gauge—compliments of the Valley AIRNow outreach program.

Following the presentation, a brief focus group was held with each Drivers Education class in support of the Clean Air Champions evaluation phase. Students were asked for input on program improvement and suggestions for adapting the program to the lifestyles of high school students in Virginia. For more information on the Clean Air Champions program, refer to Page 15 or Appendix F of this report.

- April 18, 2007: SHENAIR and Valley AIRNow partnered with the Virginia Department of Environmental Quality to host an educational Earth Day event for area high school students at James Madison University. The theme of the outreach event was “Protecting the Earth’s Natural Resources.” Students circulated between four interactive stations including Clean Air Champions, Science on a Sphere, vehicle emissions monitoring, and a tour of the city’s Resource Recovery facility. James Wood High School, a Frederick County Public school, was scheduled to attend the event. Refer to page 13 or Appendix H for additional information on this Earth Day event.
- June 25 - 29, 2007: SHENAIR and Valley AIRNow held a summer workshop for Shenandoah Valley teachers on the campus of James Madison University. The workshop consisted of three mini-workshops featuring GLOBE (Global Learning and Observations to Benefit the Environment) protocols, Geographic Information Systems (GIS) instruction, and Science on a Sphere dataset visualizations. The workshop was open to teachers in science and other related fields (e.g., environmental science, ecology) of grades 4 – 12. Continuing education credits were awarded following completion of each mini-workshop. Valley AIRNow’s outreach coordinator, Ms. Tiffany Tumer, served as the instructor for the GLOBE surface ozone protocol. Refer to page 19 or Appendix N for more information.

### School-based Public Awareness Program

#### *Educators Air Quality Action Day Program: Ozone Season 2007*

Winchester City Public Schools and Frederick County Public Schools again participated in the Air Quality Action Day program for the 2007 ozone season. Each school system supported a designated clean air coordinator who was responsible for receiving and disseminating any Action Day Alerts throughout the schools.

#### *James Madison University Earth Day event: April 18, 2007*

SHENAIR and Valley AIRNow partnered with the Virginia Department of Environmental Quality to host an educational Earth Day event for area high school students at James Madison University. The theme of the outreach event was “Protecting the Earth’s Natural Resources.” Students circulated between four interactive stations, including Clean Air Champions, Science on a Sphere, vehicle emissions testing, and a tour of the city’s Resource Recovery facility.

- Clean Air Champions: A curriculum (Appendix F) created by VDEQ and the American Lung Association of Virginia to educate motorists on the relationship between air quality and proper car maintenance—specifically, proper tire inflation. The highlights of this station included a vehicle simulator and cubic meter model. Students learned how to properly measure tire pressure by practicing on a biodiesel Chevrolet Blazer (Figure 5A and 5B).
- Science on a Sphere (SOS): A 3-D visualization theatre that projects animated images onto a unique six-foot diameter spherical movie screen (Figure 5C). Students viewed datasets displaying dynamic changes in Earth's atmosphere, oceans, and land cover.
- Vehicle Emissions Testing: VDEQ, under contract with ESP Technology, demonstrated the use and operation of remote sensing devices (RSDs) to measure vehicle exhaust emissions (Figure 5D). Students viewed various vehicles passing through the infrared and ultraviolet light directed across the road by the RSD. A detector then monitored the absorbed light to quantify the concentration of the three regulated pollutants of interest—nitrogen oxides, hydrocarbons, and carbon monoxide. A large screen then displayed the words “good,” “fair,” or “poor,” depending upon the vehicle's emission readings.
- Harrisonburg City Resource Recovery Facility Tour: Municipal solid waste is collected from around the City and JMU and then brought to this Resource Recovery facility to be incinerated, generating power to heat a portion of JMU's campus. Students toured the facility to understand this process and the environmental impacts and regulations of incineration on local air.



**Figure 5: James Madison University Earth Day event. A) A JMU Chevrolet Blazer operated on biodiesel-20; B) Valley AIRNow staff helps a student check tire pressure on the Biodiesel Blazer; C) Students view atmospheric changes on Science on a Sphere; D) A JMU vehicle passes by a remote sensing device at the VDEQ vehicle emissions testing station**

Refer to Appendix H for the Earth Week agenda and Appendix L-32 and L-33 for news coverage of the event.

*Virginia Clean Air Champions Program: Evaluation Phase Completed May 2007*

Virginia Clean Air Champions (CAC) is a statewide campaign led by the VDEQ Office of Environmental Education and the American Lung Association of Virginia (ALA). The purpose of the program is to educate motorists, particularly new drivers, about the benefits of improving air quality by reducing fuel consumption and ozone generation through proper car maintenance. VDEQ and ALA are currently in negotiations with the Virginia Department of Education to require a Clean Air Champions lecture in all state Drivers Education courses this fall.

SHENAIR and Valley AIRNow were approached by VDEQ and ALA in January of this year to assist in the evaluation phase of the Clean Air Champions program. VDEQ was interested in piloting the program in Virginia's two ozone Early Action Compact areas—Winchester and Roanoke. Consequently, a partnership was established between the American Lung Association, Virginia Department of Environmental Quality, The SHENAIR Institute (James Madison University), and Valley AIRNow (Winchester City – Frederick County) to evaluate the CAC program. As part of the assessment effort, Valley AIRNow led six focus groups with James Wood High School—a public school located in Frederick County, Virginia. The goals of this evaluation were to:

- Analyze overall program effectiveness;
- Identify needed areas of improvement; and
- Provide feedback to enhance future program development and success.

The focus groups were held from February 21<sup>st</sup> to 22<sup>nd</sup>, 2007 at James Wood High School. A total of six Drivers Education classes, equivalent to approximately 200 students, participated in the evaluation. The focus groups consisted of both males and females, primarily Caucasian, ranging in age from 15 to 17 years. Each focus group varied from approximately 1 hour to 2.5 hours in length, dependent on class schedule.

The format of the James Wood Clean Air Champions focus group and presentation, along with a brief description of each item, is listed below.

1. **Introduction/Purpose.**
2. **Completion of CAC pretest** (Appendix F-1). The pre- and posttests were originally developed by VDEQ and ALA for the CAC campaign and further revised by Valley AIRNow during the evaluation phase. The tests were reformatted, and additional questions on tire pressure and car maintenance were inserted.
3. **Presentation of revised PowerPoint for schools** (Appendix F-5). Similarly, a canned PowerPoint presentation, which was originally developed by VDEQ and ALA, was further revised by Valley AIRNow during the evaluation phase. The PowerPoint show was adapted to appeal to high school students by inserting additional visual components, formatting the text to note-style, and adding an informational slide on alternative fuels.
4. **Vehicle Simulator activity** (Figure 6). The students were given an opportunity to ride a stationary bicycle with properly inflated tires followed by under-inflated tires to experience the increase in rolling resistance and physical exertion. They were then asked to apply this simulation to a vehicle with just one under-inflated tire. Consequently, a connection between proper tire inflation, fuel consumption, and vehicle emissions were made.





Figure 6: Students decrease tire pressure on the Vehicle Simulator

5. **Completion of CAC posttest** (Appendix F-3). The average number of total questions missed on the pretest was approximately 5 for an average grade of 62%. As a result of the Clean Air Champions presentation, however, scores on the post-test were significantly improved. The average number of total questions answered incorrectly on the posttest was roughly 2 and the average posttest score improved to 83% (Table 10, Appendix F). The difference in test scores by gender was not significant and varied by less than 1%.
6. **Tire pressure measurement activity** (Figure 7). Each student was provided with a tire pressure gauge customized with the Valley AIRNow logo—compliments of the Valley AIRNow outreach program. The students were then organized into teams and instructed to find the recommended and actual tire pressure of a designated tire on a state vehicle outside. This activity allowed students to learn where to find a vehicle's recommended tire pressure and how to properly measure tire pressure using a tire gauge. Students were encouraged to use their gauges once every month on their personal vehicle.



Figure 7: A James Wood student checks tire pressure on a state vehicle

7. **Focus group session.** Following the tire pressure measurement activity, the students were asked to form small, brainstorming groups to answer several questions regarding the effectiveness of the overall Clean Air Champions campaign and to identify needed areas of improvement. For example:
  - a. What did you like or find interesting about the campaign?

- b. What didn't you like about the campaign?
- c. Did you learn anything new today? If yes, please specify what you learned.
- d. Do you plan to practice any of the actions discussed today to reduce your emissions? If yes, please specify what you will practice.
- e. Is there anything we can improve?

Listed below are some select responses received from the James Wood focus group session.

- "Going outside to check the tire pressure of an actual car was fun and educational."
- "[We liked] the vehicle simulator and how we saw the changes between inflated and deflated [tires]."
- "We learned how to use tire gauges."
- "Learning about air quality scale, because we didn't know what it was."
- "...We didn't know that putting gas in your car/truck at night is healthier for the environment."
- "We didn't know the difference between the two ozones [before the presentation]."

Refer to Appendix F-30 for more results from the James Wood CAC focus group session.

8. **Distribution of *What's Your PSI?* worksheet.** The PSI worksheet (Appendix F-26) developed by SHENAIR and Valley AIRNow was assigned as homework by the Drivers Education teachers. Students were asked to go home, measure the tire pressure of a family vehicle, and record the data on the worksheet.
9. **Completion of CAC pledge cards.** As a result of the Clean Air Champions presentation, the students were asked to pledge which activities they would implement into their driving lifestyles to mitigate their personal vehicular emissions. The pledge options included:
  - Walk, bike, use public transit, or carpool when possible.
  - Keep your car maintained according to the manufacturer's specification.
  - Check your tire pressure and keep your tires properly inflated.
  - Limit engine idling.
  - Trip chain—combine errands into one trip.
  - Drive gently at moderate speed.
  - Fill up your gas tank after dusk on hot summer days.

The most popular pledge made by the James Wood High School students was to check tire pressure and maintain proper tire inflation (71%), followed by trip chaining and proper car maintenance.

For more information on this evaluation of the Clean Air Champions program, refer to the selected text in Appendix F-30 from the Valley AIRNow report submitted to VDEQ. This report was included in the final Virginia Clean Air Champions report submitted to the EPA on May 10, 2007.

*Idle Reduction Outreach Program: Ongoing 2007*

Beginning in the fall of 2006, Valley AIRNow has worked with area public and private schools to launch a program that will educate parents, teachers, and students on the health and

environmental effects associated with vehicle engine idling in school zones. A variety of free, educational tools were developed and printed to promote the initiative, including an idle-reduction street sign (Figure 8A) and bumper sticker (Figure 8B).

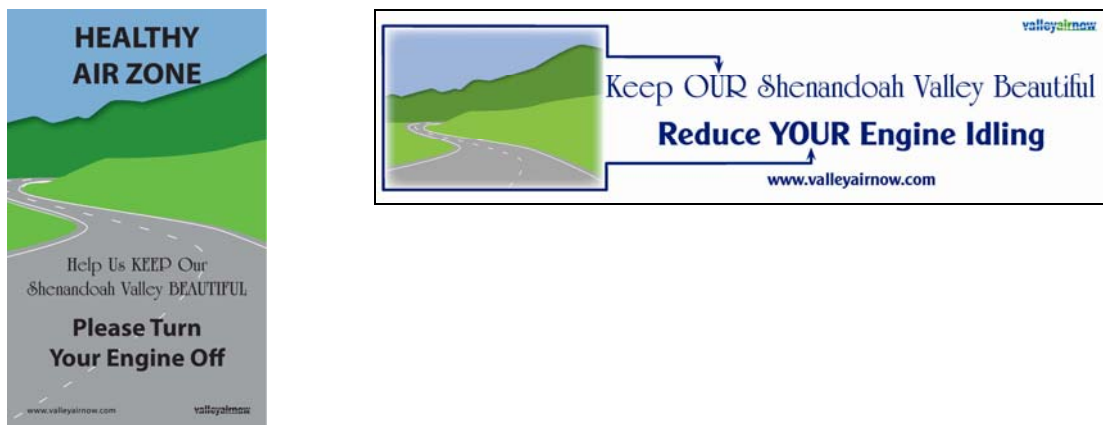


Figure 8: Idle reduction program materials for schools; A) Metal street sign; B) Bumper sticker

Since January of this year, Valley AIRNow has worked closely with both public school systems in Winchester-Frederick County, as well as with two private schools in the area. To date, approximately 37 signs (including u-channel posts and hardware for mounting) have been distributed for installation at the schools and school systems listed in Table 1.

Table 1: Idle reduction street signs to be installed at area schools

School	# of Signs
<b>Frederick County Public Schools</b>	
Apple Pie Ridge Elementary	1
Armel Elementary	1
Bass-Hoover Elementary	1
Evendale Elementary	1
Gainesboro Elementary	1
Indian Hollow Elementary	1
Middletown Elementary	1
Orchard View Elementary	1
Redbud Run Elementary	1
Senseny Road Elementary	1
Stonewall Elementary	1
Admiral Richard E. Byrd Middle	1
Frederick County Middle	1
James Wood Middle	1
Robert E. Aylor Middle	1
James Wood High	2
Millbrook High	1
Sherando High	2
Dowell J Howard Center	1
Northwestern Regional Education Programs	1
Parent Resource Center	1
Northern Shenandoah Valley Adult Education	1
<b>TOTAL</b>	<b>24</b>
<b>Winchester Public Schools</b>	
Frederick Douglass Elementary	1
John Kerr Elementary	1
Quarles Elementary	1

Virginia Avenue Charlotte Dehart Elementary	1
Daniel Morgan Middle	2
John Handley High	1
Douglas Community Learning Center	1
Daniel Morgan Middle Bus Loop	1
Winchester Public Schools Bus Garage	1
<b>TOTAL</b>	<b>10</b>
<b>Mountain View Christian Academy</b>	<b>2</b>
<b>Winchester Academy</b>	<b>1</b>
<b>TOTAL</b>	<b>37</b>

Installation of the above signs will occur throughout the summer with an expected completion date of September 2007. At this time, Valley AIRNow intends to run a publicity campaign with Winchester-Frederick County news media to promote the school idle reduction street signage. To accompany the signs and public relations campaign, Valley AIRNow tentatively plans to pursue the following educational outreach activities:

- Develop an introductory article to the idle reduction program that can be placed in school newsletters or on school web sites.
- Develop a PowerPoint show that can be presented to interested classes or parent groups (e.g., PTOs) explaining the potential impacts of vehicle engine idling on children.
- Develop a subscriber-based Valley AIRNow newsletter where students, parents, or other interested community members can learn about local air quality issues, sources of pollution, sensitive groups, and actions individuals can take to reduce personal emissions.

This summer, Valley AIRNow will continue to approach private schools in the area to increase participation in the school idle reduction program.

*Teacher Training Workshop: June 25 – 29, 2007*

SHENAIR and Valley AIRNow held a summer workshop for Shenandoah Valley teachers on the campus of James Madison University. The workshop consisted of three mini-workshops featuring GLOBE (Global Learning and Observations to Benefit the Environment) protocols, Geographic Information Systems (GIS) instruction, and Science on a Sphere dataset visualizations. The workshop was open to teachers in science and other related fields (e.g., environmental science, ecology) of grades 4 through 12. Continuing education credits were awarded following the completion of each mini-workshop. Valley AIRNow's outreach coordinator, Ms. Tiffany Tumer, served as the instructor for the GLOBE surface ozone protocol.

*Smog Dog: Ongoing 2007*

Smog Dog (Figure 9), the Valley AIRNow program mascot, continues to be used at events as an educational, public outreach tool for kids.



**Figure 9: Smog Dog—Valley AIRNow's official mascot**



## Employer-based Ozone Action Days/Ozone Action Days for Area Sources

### *Valley AIRCorps program: Ongoing 2007*

Valley AIRCorps is the Business Outreach and Promotions Program of the Northern Shenandoah Valley Ozone Early Action Plan. Valley AIRCorps is a no-cost program that seeks to create, nurture, and promote clean air partnerships with businesses in the Northern Shenandoah Valley. The program spreads the word about our air quality challenges and provides valuable public health networking.

The center of the AIRCorps program is membership in the Air Quality Action Day Network (AQAD)—a network to inform the community of health risks on Code Orange Action Days or higher, and to take simple steps to reduce smog-inducing emissions. Businesses appoint a Clean Air Coordinator (CAC), who subscribes to the AQAD email or fax notification system. Valley AIRNow sends out a media release to each CAC when ozone levels are predicted to be Code Orange or higher. In return, each AIRCorps member agrees to disseminate the AQAD information to all employees and/or customers. This informational dispersion may take the form of one or more of the following methods: email notification to all employees, a media release or AQAD poster displayed on employee message boards, personalized AQAD poster displayed in heavily trafficked areas (e.g., waiting rooms, lobbies, store windows, checkout registers, etc.), verbal announcements to employees and/or customers throughout the day. Additional methods of AQAD dissemination continue to be explored with AIRCorps Clean Air Coordinators.

As of June 2007, 29 Winchester-Frederick County businesses have enlisted in the Valley AIRCorps program to receive Air Quality Action Day alerts. A current list of these businesses can be viewed on the Valley AIRNow Web site at <http://www.valleyairnow.com/aircorpsmembers.htm>.

### *AIRCorps Program Recruitment Campaign: Ongoing 2007*

Valley AIRNow continues to recruit new members for the AIRCorps program and AQAD network by partnering with the Top of Virginia Regional Chamber of Commerce. A recruitment letter is distributed via fax to the hundreds of Chamber members explaining the AIRCorps program and encouraging businesses to register online at <http://www.valleyairnow.com/aircorpsregistration.htm>. This letter will continue to be faxed until all 1,300+ Chamber members are reached.

Valley AIRNow also recently created an advertisement promoting the AIRCorps program for inclusion in the Top of Virginia Regional Chamber *Business Agenda*. Additional ads were developed to promote the Valley AIRNow outreach program in general, as well as to educate business leaders on the Air Quality Index and to describe steps that companies can take to reduce emissions while saving money. Refer to Figure 4 to view the draft ads.

Additional forms of recruitment for the AIRCorps and AQAD network will be explored throughout 2007.

### *Top of Virginia Regional Chamber Business Agenda: Ongoing 2007*

Since 2005, Valley AIRNow has partnered with the Top of Virginia Regional Chamber of Commerce (formally the Winchester-Frederick County Chamber) to submit informational air quality articles for inclusion in the monthly *Business Agenda*. Eighteen hundred copies of this business newsletter are printed and mailed to key community business leaders and are distributed at high traffic locations in the area every month.

Refer to Appendix D for a sample Valley AIRNow article published in the February 2007 Top of Virginia Regional Chamber *Business Agenda*.

*Clean Diesel Network: Ongoing 2007*

A sixth dimension of the Air Quality Action Day Network was developed late last year and is referred to as the Clean Diesel Network (CDN). The CDN was created due to the recent increase in traffic on Interstate-81. I-81 serves as one of the most important transportation corridors on the East Coast and is the route for a large majority of the truck traffic in the Shenandoah Valley. Although this interstate traffic is essential to the economic vitality of the Valley, there is increasing concern about the health and environmental effects associated with diesel engine exhaust.

The Clean Diesel Network is a program specific to all Winchester-Frederick County members of the freight industry, including fleet and trucking companies, truck stops, and rest areas. By enrolling in the CDN, members agree to educate employees and/or customers about better engine management practices (i.e., reduced idling), particularly on ozone Action Days. When an Action Day is predicted, the designated Clean Air Coordinator will receive a press release explaining the health risks involved and the steps each business can take to reduce emissions for that day.

Other membership benefits that CDN members enjoy include:

- Publicity on the Valley AIRNow Web site. A list of participating members can be viewed by visiting <http://www.valleyairnow.com/cdnmembers.htm>.
- Publicity at local events. CDN members, along with AIRCorps members, will be recognized at all Winchester-Frederick County events in which Valley AIRNow participates.
- Educational materials (e.g., poster, bookmark/magnet, brochure, bumper sticker, idle reduction street sign, etc.).
- Idle reduction street signs. For those CDN businesses that may be interested, Valley AIRNow will post signs (G-1) in truck parking zones to encourage drivers to turn off their engines.
- Annual awards. CDN members will be provided with certificates of appreciation and exemplary service to the community for their participation in the network.

To date, Valley AIRNow is in the recruitment stages of the Clean Diesel Network. The brochure, bookmark, poster, and bumper sticker have been printed and will be presented to members upon enrollment. Member recruitment will extend through ozone season 2007.

For more information on the Clean Diesel Network, visit the Valley AIRNow Web site at <http://www.valleyairnow.com/cleandieselnetwork.htm>. To register for the CDN online, potential members may visit <http://www.valleyairnow.com/cdnregistration.htm> or contact Tiffany Tumer at [tumerta@jmu.edu](mailto:tumerta@jmu.edu).

*Idle Reduction Program: Ongoing 2007*

Last fall, Valley AIRNow developed a program to educate area businesses and community members on the health and environmental effects associated with vehicle engine idling. A variety of free, educational tools were developed to promote the initiative, including an idle-reduction street sign (Figure 8A) that can be displayed in parking lots and other commercial areas where idling occurs.

The idle reduction signage was printed by a local vendor in April. The idle reduction signs (Appendix G-1) are metal, 12" x 18" in dimension, and printed on 10-year vinyl. Mounting options include either u-channel posts (also provided free of charge by Valley AIRNow) or installed directly on the sides of buildings.

Due to overwhelming demand for the signs, the Northern Shenandoah Valley Air Quality Improvement Task Force participated in an online survey in April to identify where the most

effective locations in the area would be to install the idle-reduction street signs. The results from this survey would determine which businesses would be given first priority to display the signs at their facilities. The sign survey was created by Valley AIRNow using WebSurveyor. Survey participants were asked to rank each potential sign location on a scale from one to five, with five being the most effective. The options for potential sign locations included:

- Athletic fields
- Day care centers
- Gas stations/convenience stores
- Park-and-rides/commuter lots
- Parks, playgrounds, and other recreational areas
- Retirement homes and adult care centers
- Schools (public and private)
- Shopping centers/Apple Blossom Mall
- Valley AIRCorps businesses
- Virginia Inland Port, truck stops, and travel plazas
- Winchester Medical Center
- Other

Of the surveys distributed to the 23 members of the Task Force for completion, 9 responded for a participation rate of approximately 40%. Results from the survey showed that the most effective sign locations were:

1. Schools
2. Day care centers
3. Virginia Inland Port, truck stops, and travel plazas
4. Gas stations/convenience stores

Based on these results, Valley AIRNow approached and partnered with several local petroleum companies, day care centers, and other businesses to display the signs in areas experiencing high engine idling times. To date, a total of 37 signs have been distributed for installation at the locations listed in Table 2. For those businesses lacking Facilities Management (i.e., day care centers), a local business named DK Industrial Services volunteered to handle sign installation.

**Table 2: Winchester-Frederick County businesses displaying idle reduction signage**

<b>Business Name</b>	<b>Location</b>	<b># of Signs</b>
Abundant Life Daycare & Preschool	Stephens City	1
Emmart Oil Company	Winchester	4
H.N. Funkhouser	Winchester	20
Morgan Oil Corp.	Marshall	4
Rosedale Baptist Church Kiddie Kollege	Winchester	4
Shenandoah Child Care Center	Winchester	2
Virginia Inland Port	Front Royal	2
<b>TOTAL</b>		<b>37</b>

Valley AIRNow will continue to approach those businesses deemed most effective (e.g., schools, day care centers, travel plazas, gas stations) throughout ozone season 2007 to install a total of 100 idle reduction signs in the Winchester-Frederick County area.



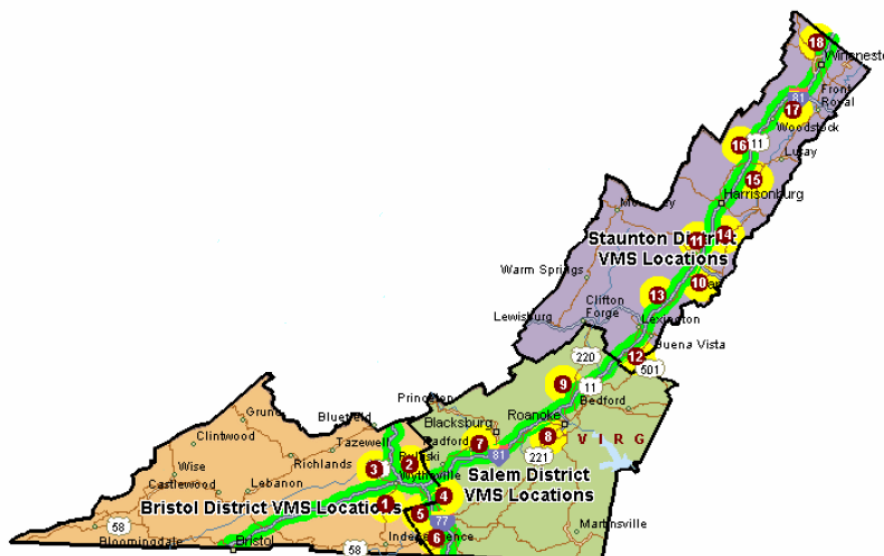
## Dynamic Message Signs

### *Episodic Ozone Program: Ozone Season 2007*

Virginia Department of Transportation (VDOT) highway variable message signs are activated when VDEQ forecasts an Air Quality Action Day. The message signs will display the words "Air Action Day" to inform motorists of a potential 8-hour ozone exceedance. Refer to Appendix I for VDOT changeable message sign protocols.

VDOT currently operates two variable message signs in Northern Shenandoah Valley at the following locations:

1. I-81 Northbound, mile marker 287.5 (#17, Figure 10), and
2. I-81 Southbound, mile marker 323.1 (#18, Figure 10).



**Figure 10: VDOT variable message sign locations for Bristol, Salem, and Staunton districts**

(Source: Virginia Department of Transportation)

## Video Monitor System Deployment

### *Public Availability of Traffic and Visibility Web Cameras: Maintained 2007*

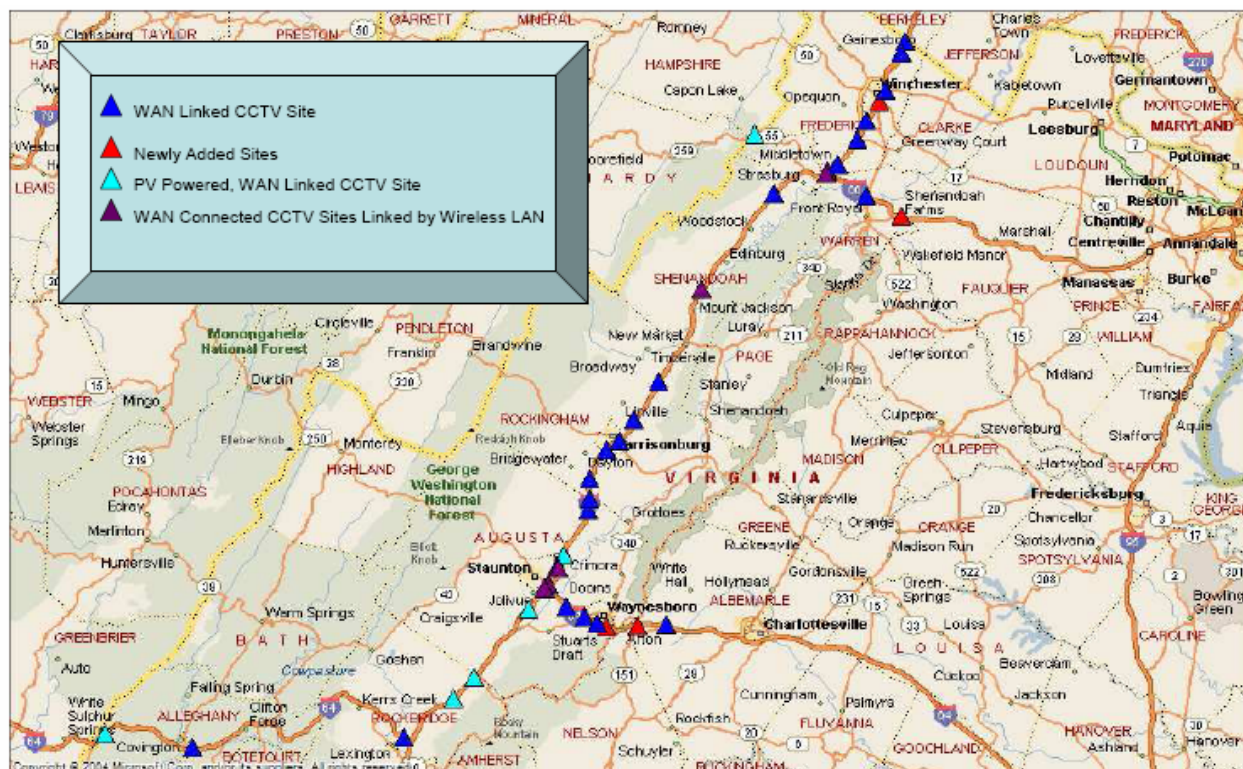
Visibility and traffic webcams are made available to the public on the Valley AIRNow homepage year round. In 2004, VDOT initiated a closed circuit television (CCTV) pilot by placing various models of IP-addressable cameras at several positions along the I-81 corridor at New Market, Strasburg, and Woodstock. In 2006, VDOT expanded the project and installed approximately 30 additional IP-addressable cameras throughout the District along I-81, I-64, and I-66. Current I-81 locations for cameras in the Northern Shenandoah Valley area are listed in Table 3 below. A link to these webcams, as well as a visibility camera overlooking the Potomac River in Washington, D.C., is also available on the Valley AIRNow homepage. To date, no new traffic cameras have been installed in the Winchester-Frederick County area.

**Table 3: Locations of VDOT traffic cameras in the Northern Shenandoah Valley**

(Source: Virginia Department of Transportation, Smart Traffic Center)

Camera Location	Mile Post
New Market	I-81, Exit 264
Mount Jackson	I-81, Exit 273
Woodstock	I-81, Exit 283
Toms Brook	I-81, Exit 291
Strasburg	I-81, Exit 298
Strasburg	I-81, Exit 300 (westerly view)

Strasburg	I-81, Exit 300 (southerly view)
Middletown	I-81, Exit 302
Stephens City	I-81, Exit 307
South Winchester	I-81, Exit 310
Winchester	I-81, Exit 313
Winchester	I-81, Exit 313
Winchester	I-81, Exit 315
Clearbrook	I-81, Exit 321
WV State Line	I-81, Exit 323
Shenandoah Farms	I-66, Exit 13
Front Royal	I-66, Exit 6
Frederick County	Route 55 West



**Figure 11: Shenandoah Valley map of IP-addressable traffic camera locations**  
(Source: Virginia Department of Transportation, Smart Traffic Center)

## Lawn & Garden Equipment Usage Restrictions

### *Local Government Air Quality Action Day Program: Ozone Season 2007*

On May 1, a memorandum regarding local government actions on Air Quality Action Days was issued by the Frederick County administrator to all respective local government agencies and offices. This memorandum, located in Appendix J, specified the postponement of mowing on Air Quality Action Days, which included the use of publicly owned gasoline and diesel powered mowers, weed eaters, and other similar gasoline engines. Other AQAD actions specified in the memorandum included postponement of the use of oil-based paints and solvents, restrictions on engine idling, restrictions on any burning associated with county land clearing and construction, as well as the limitation of prolonged outdoor exertion by government employees.

*VDOT Episodic Ozone Program: Ozone Season 2007*

On April 20, VDOT issued a memorandum (Appendix I) for employees that outlined 2007 VDOT actions on Air Quality Action Days. These actions, which are recommended on Code Orange Days and are mandatory on Code Red days, included the following ozone alert procedures:

- Travel reduction;
- Postponement of mowing;
- Fueling restrictions;
- Use of variable message signs;
- Reduction of electricity usage;
- Postponement of painting;
- Limitations on prolonged physical exertion.

Also on April 20, VDOT issued a memorandum for employees regarding 2007 VDOT gas restrictions on Code Red Air Quality Action Days. This memorandum, located in Appendix I, specified that gasoline pumps operated by VDOT in early action compact areas that do not have vapor recovery systems would be closed from 8:30 a.m. to 5:00 p.m. on these days. Travelers needing to refuel state cars in Winchester-Frederick County on Air Quality Action Days are required to do so before 8:30 a.m. or else make other refueling arrangements. According to the memo, "this measure has been implemented by VDOT since 1996 and is intended to reduce air pollutant emissions from VDOT facilities and improve the air quality for the citizens of the Commonwealth."

## **2. VMT Reduction Programs**

This strategy combines a number of individual programs/activities designed to reduce vehicle miles of travel (VMT).

Control Strategies:

### Enhance/Expand existing Northern Shenandoah Valley Regional Commission (NSVRC) Ridesharing Program

From January to June 2007, the NSVRC, operating through its Valley Commuter Assistance Program (VCAP), has been involved with the following programs and activities to promote ridesharing and improve air quality in the Northern Shenandoah Valley area (Appendix O). For additional information on the Northern Shenandoah Valley Regional Commission's Rideshare Program, visit <http://www.vcapride.virginia.gov/>.

#### *Conferences and Presentations*

NSVRC staff plan to attend the Virginia TDM/Ridesharing Conference in Charlottesville, VA from July 11 – 13 where information and ideas will be exchanged with other rideshare programs from across the state.

NSVRC has also made arrangements to attend the Association for Commuter Transportation (ACT) International Conference on September 9 – 13 in Seattle, Washington. Again, the primary purpose of participating in this conference is to network with other rideshare programs from across the U.S.

#### *Media Advertising*

NSVRC staff recently developed *The Key* Newsletter—an electronic newsletter that is distributed to all persons registered with VCAP. This newsletter provides a wealth of traffic and



rideshare information, including where to obtain updated VDOT highway construction alerts, openings in existing vanpool and carpools, and details on commuter bus operations.

Earlier this year, VCAP reached an agreement with S&W Tours—the company which operates the Washington, D.C. commuter bus service—to place large transit ads on its Northern Shenandoah Valley bus advertising the commuter assistance program. VCAP is also currently in negotiations with S&W Tours to display transit ads on the remaining two commuter buses that they are currently operating in the area.

Additionally, NSVRC is currently in the process of coordinating a media advertisement project for the 2007 fall and winter months. At this time, VCAP plans to run a media campaign on Comcast Cable Television in which a series of crawl advertisements will play on the Weather Channel early weekday mornings and evenings to promote the commuter bus service. VCAP phone numbers and Web site links to obtain additional information will be provided in the ads as well.

#### *Employer Outreach*

NSVRC staff is currently working with RGS TITLE, LLC, a Mid-Atlantic residential real estate settlement company, to provide their employees with a commuter bus to the RGS TITLE Winchester Office. In addition, NSVRC is in communications with two large federal government agencies—Federal Emergency Management Agency (FEMA) and the Federal Bureau of Investigation (FBI). FEMA and the FBI are scheduled to build facilities in the Frederick County area and are interested in a commuter bus which will operate between the metropolitan area and the County.

NSVRC staff continues to work with employers in the Westfields Business Park located in Chantilly, Virginia to determine whether enough demand exists to establish a second commuter bus. To date, only one bus runs between the Business Park and the Northern Shenandoah Valley.

#### *Materials Development*

S&W Tours recently produced two informational documents for VCAP:

1. A commuter bus pool schedule outlining the routes and stops of the Woodstock-Front Royal-Linden to Vienna metro-Rosslyn metro-Pentagon-Washington D.C. bus service (Appendix O-3);
2. A cost analysis spreadsheet comparing the cost of bus pool, omni ride, and VRE ridership (Appendix O-4).

#### *Rideshare Programs*

NSVRC created four new vanpools containing 10 to 13 passengers each to serve the Northern Shenandoah Valley area.

In 2006, two new commuter bus services were created which carried passengers to the Central Intelligence Agency's (CIA's) Central Office in Fairfax County outside of McLean, Virginia. This year, a third new commuter bus was created to service this area. To date, ridership totals approximately 32 passengers and a stop at the Vienna metro has been added.

NSVRC also continued to support several private commuter bus services. One is a commuter bus traveling to Westfields Business Park in Fairfax County. Twenty-nine riders currently use this service. The second service is a bus traveling between the Woodstock-Front Royal-Linden area and Rosslyn metro-Pentagon-Washington, D.C. on the I-66 corridor. To date, ridership totals 32 passengers—up slightly from 22 passengers reported in December. Additionally,

NSVRC staff is working to establish a second private bus to Rosslyn-Pentagon-Washington, D.C. that will operate on a later time schedule than the existing service.

Finally, NSVRC staff is currently in the process of working to establish a commuter bus service operating between the Winchester/Clarke County area and Rosslyn metro-Pentagon-Washington D.C.

#### *Park and Ride Lots*

To date, NSVRC has identified 11 park and ride lots in the Northern Shenandoah Valley area, totaling 1,050 parking spaces available for commuters. A list of these lots is included in Table 4 below. Discussions with VDOT, Clarke County, and Berryville to explore available options for the creation of a park and ride lot within the Town of Berryville continue. Additionally, NSVRC is working with VDOT and Warren County to find ways to increase park and ride lot capacity at the Front Royal and Linden lots. These lots are currently operating at 100% capacity and additional spaces are required.

**Table 4: NSVRC Park and Ride Lots in the Northern Shenandoah Valley area**

(Data compiled from <http://www.vcapride.virginia.gov/>)

County	Lot Name	Location	# of Spaces
Clarke	Double Tollgate	US 340 / US 522	17
Clarke	Waterloo	VA 340 at US 50	160
Fauquier	Markham	Rt. 688 & I-66	15
Fauquier	Marshall	Frost Road	75
Fauquier	Remington	VA 651 & US 15 / 29 / 17	16
Fauquier	Warrenton	US 29 / 211 & VA 605	212
Page	Luray	Rt. 340 & Rt. 211 Bypass	103
Page	Shenandoah	Off Rt. 602	30
Shenandoah	Strasburg	Rt. 11	30
Warren	Front Royal	I-66 & US 340 / 522	262
Warren	Linden	I-66 & Rt. 647	130

In addition, NSVRC is currently in negotiations with a church located in Clarke County to obtain 20 – 30 parking spaces for commuter vehicles during weekdays (Monday – Friday).

Although no park and ride lots currently exist within the Winchester-Frederick County MPO area, the 2030 Transportation Plan (refer to Bicycle and Pedestrian Accommodation) includes the development of two future park and ride facilities at:

- US Route 522 near Tasker Road (Route 642) and
- Route 7 between I-81 and the Clarke County Line.

#### *Rideshare Matching Services*

NSVRC continues to provide rideshare matching services to the Northern Shenandoah Valley area. Since November 2006, NSVRC staff received and responded to 275 new matching requests for carpools, vanpools, and commuter bus services as well as 110 renewal requests from existing VCAP members. These numbers are up significantly from the 125 new matching requests and 70 renewal requests reported in December.

## Bicycle and Pedestrian Accommodation

### *Winchester-Frederick County Metropolitan Planning Organization (MPO) Bicycle and Pedestrian Mobility Plan*

A study to provide a connected and comprehensive network of bicycle and pedestrian facilities in the MPO study area (Winchester-Frederick County Urbanized Area) began in 2005. The goals of the plan are to provide new facilities that will create logical connections to existing facilities; enhance recreational opportunities; improve access to schools, libraries, and other public facilities; and provide an alternative to using a personal automobile.

Toole Design Group, LLC, one of the nation's leading planning and design firms specializing in multi-modal transportation, serves as the consultant for the study. Toole Design has developed similar projects in the past, including the Maryland Pedestrian and Bicycle Safety Education Program, the District of Columbia Bicycle Master Plan, and the Loudoun County Bicycle and Pedestrian Mobility Master Plan.

Earlier this year, Toole Design submitted a draft document of the Bicycle and Pedestrian Mobility Plan for the Winchester-Frederick County MPO. This seven chapter document included introductory information on the importance of an alternative mobility infrastructure, vision, goals, and objectives, existing bicycling and walking conditions in the area, major online questionnaire results, bicycle and pedestrian facility design guidelines, facility recommendations, policy and program recommendations, an implementation plan, and draft maps (Figures 12 and 13 below) for proposed bicycle and pedestrian networks.

In Chapter One of the *Plan*, air quality improvement is specifically listed as one of the important reasons behind why walking and bicycling infrastructure is essential to the Winchester-Frederick County region. The plan states that:

"Increased bicycling and walking for transportation can help to improve air quality and reduce traffic congestion in the Winchester Frederick region.

- Increased levels of bicycling and walking can play an important role in reducing air pollution. As mentioned previously, Frederick County and Winchester are in danger of being declared a non-attainment area for ozone. National transportation survey data reveals that 48.8% of all trips are less than 3 miles in length. By substituting a bicycling or walking trip for these short automobile trips, area residents could significantly impact the amount of pollutants generated by automobiles. In addition, studies have shown that short automobile trips are especially problematic: approximately 60% of the pollution created by automobile emissions is emitted in the first few minutes of operation, before pollution devices begin to work effectively.
- Air pollution is a serious threat—according to the Harvard University School of Public Health, it contributes to the deaths of 60,000 people nationwide each year."

The draft Mobility Plan is available online from the MPO web site at

<http://www.winfredmpo.org/pdf/DraftBikePlan.pdf>.

Last fall, Toole Design developed an online questionnaire that was posted on the Winchester-Frederick County MPO Web site (<http://www.winfredmpo.org/>) to gather community feedback that would aid in the development of the Mobility Plan. The survey consisted of three sections: pedestrian, bicycle, and demography. A total of 543 community members responded to the survey. Major findings resulting from this survey included:

- **Existing conditions in the area are not conducive to walking and bicycling.** The top two obstacles preventing respondents from walking more is a lack of greenway

paths/trails and a lack of sidewalks. Dangerous/difficult road crossings, heavy traffic, and high-speed traffic were also named as top obstacles.

- **WinFred residents will be more likely to walk and bicycle for transportation if there are safe places to do so.** Over 80% of respondents answered that if a bicycle trail or signed bicycle route were provided near their home, they would ride on it. Ninety-five percent of respondents indicated that if there was a sidewalk or trail near their home, they would walk on it.
- **The following roadways are the ones that respondents would most like to see pedestrian and bicycle improvements:** Senseny Road, Valley Avenue (Route 11), Pleasant Valley Road, Amherst Street, Middle Road, Greenwood Road, Cedar Creek Grade.

To date, a final draft of the Bicycle and Pedestrian Mobility Plan has been developed and is scheduled for review and comment from the public and local decision makers. The anticipated completion date of the Mobility Study is summer 2007.



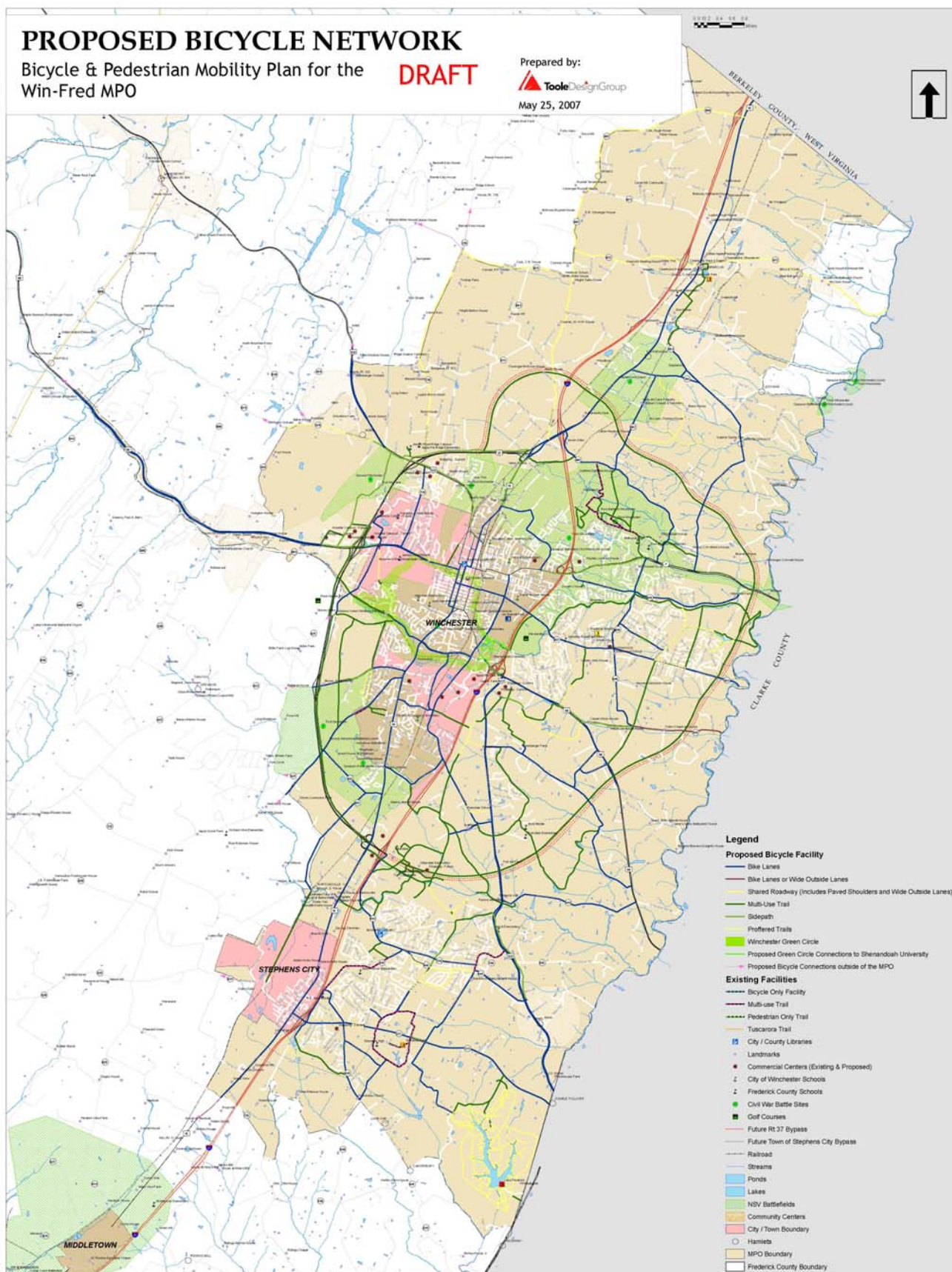


Figure 12: Proposed bicycle network for Winchester-Frederick County



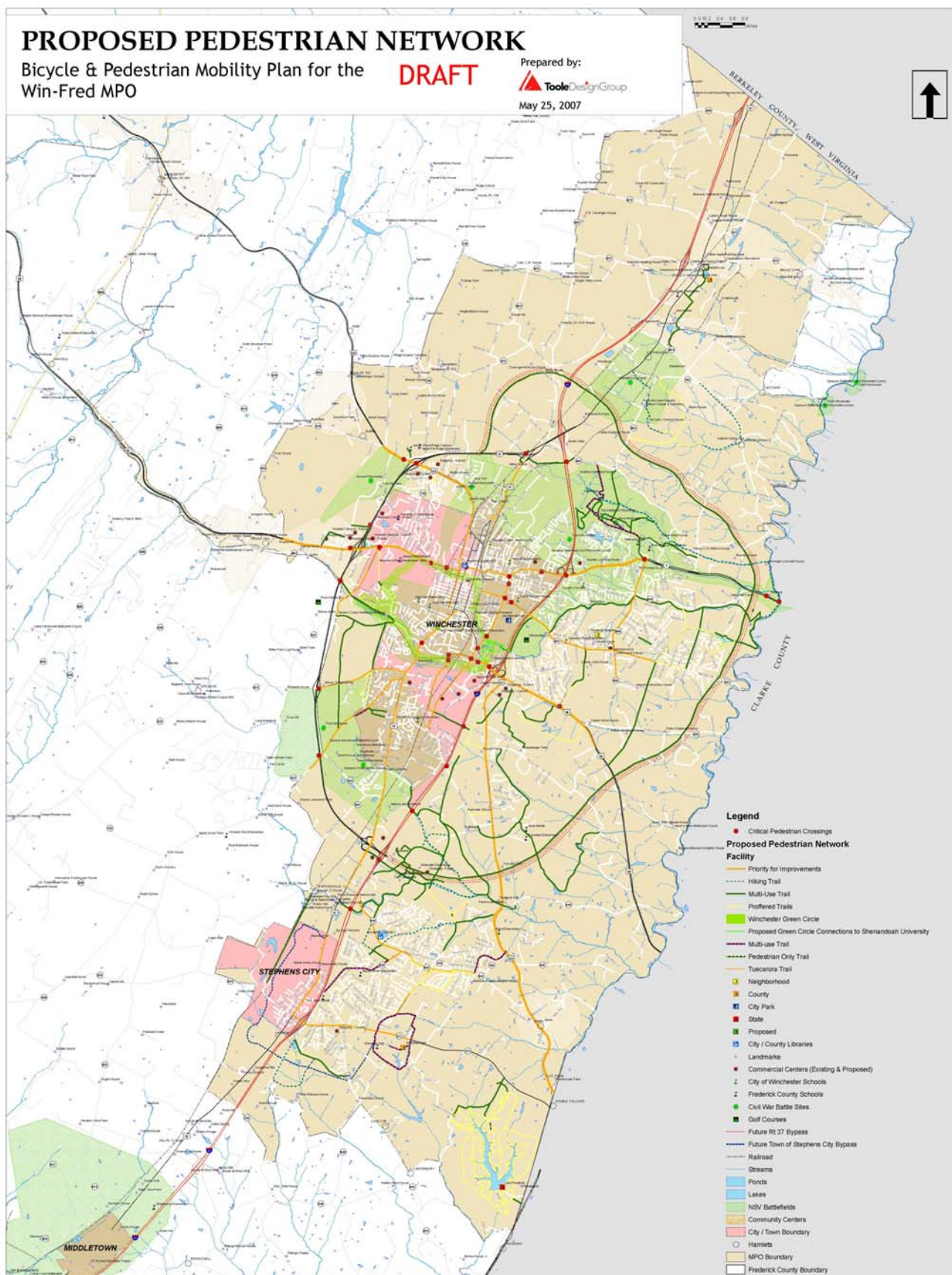


Figure 13: Proposed pedestrian network for Winchester-Frederick County

## *Winchester-Frederick County Metropolitan Planning Organization (MPO) 2030 Transportation Plan*

The Winchester-Frederick County MPO 2030 Transportation Program consists of a multi-modal transportation plan that addresses existing and current transportation needs of the Winchester-Frederick County MPO area. Among the many goals and objectives of the plan are:

- Encourage the use of alternate modes of transportation such as bicycle, pedestrian, carpooling and ridesharing, public transit, air, and rail.
- Provide a transportation network that is sensitive to the region's environment.
- Provide land use patterns that maximize the efficiency of the transportation network.

The 2030 Final Transportation Plan is currently available for public access by visiting the MPO web site at [http://www.winfredmpo.org/transplan\\_final.asp](http://www.winfredmpo.org/transplan_final.asp).

### *Bike and Pedestrian Safety Program Grant: Ongoing 2007*

In 2006, Winchester City was awarded a Bike and Pedestrian Safety grant from VDOT to incorporate pedestrian signals and crosswalks to key intersections along the Winchester Green Circle route. Earlier this year, the City of Winchester contracted with a consultant to begin work on this grant, in addition to Phase 1-A of the Green Circle (Page 34).

### *Route 11 Corridor Access Management Study*

The Northern Shenandoah Valley Regional Commission (NSVRC) and Virginia Department of Transportation (VDOT) are currently involved in a study of the U.S. Route 11 corridor spanning for eight miles from Bellview Avenue in the City of Winchester to south of the Town of Stephens City. The purpose of the study is to assess proposed improvements, policies and regulations that will reduce congestion, safely and efficiently manage access to adjacent properties, and increase roadway capacity, including bicycle and pedestrian transportation. The study is scheduled to be completed by August 2007.

### *Route 11/Route 37/Shady Elm Drive Interchange Study*

NSVRC, VDOT, and HNTB, a private consulting firm from Arlington, Virginia, are currently studying a complex interchange configuration located adjacent to Exit 310 of I-81. Due to private development near this area, congestion, accidents, and other traffic problems have increased significantly. The purpose of this study is to assess proposed improvements, policies and regulations that will reduce congestion, safely and efficiently manage access to adjacent properties, and increase roadway capacity, including bicycle and pedestrian transportation.

The MPO Policy Committee appointed a management team composed of two individuals from the city, two from the county, and one from VDOT to lead the procurement effort for this study. The study is scheduled for completion by August 2007.

### *Transportation District Feasibility Study*

The Winchester-Frederick County MPO Policy Committee carried over a Transportation District Feasibility Study from fiscal year 2004-2005. The purpose of this study was to analyze the feasibility of creating a transportation district to facilitate the expansion of mass transportation services outside the City of Winchester. This study led to the development of a Unified Planning Work Program for Fiscal Year 2007 (July 1, 2006 – June 30, 2007).

### *Virginia Department of Transportation Enhancement Grant*

On September 20, the Frederick County Planning Commission unanimously approved the authorization to apply for a Virginia Department of Transportation Enhancement Grant to implement bicycle and pedestrian improvements in the vicinity of Senseny Elementary School (Appendix Q-11). Since then, the county has formally applied for the grant with the intent to construct multi-use asphalt paths along a section of Senseny Road near Senseny Elementary. The results of the application are expected to be received later this year.

### *Walking & Wheeling the Northern Shenandoah Valley Program*

The Northern Shenandoah Valley Regional Commission and Shenandoah Valley Battlefield Foundation's Walking & Wheeling Plan was adopted in 2005 and continues to be promoted in 2006 as a source of justification for further bicycle and pedestrian accommodation studies and projects.

### Promote Green Space Preservation

#### *Frederick County Conservation Easement Authority: Ongoing 2007*

The Frederick County Conservation Easement Authority was established to assist county landowners in the protection and preservation of farm land, forests, open space, scenic landscapes, historic sites, water resources, and environmentally sensitive lands. The primary method for accomplishing this mission is for the Authority to facilitate conservation easements.

In 2007 the Easement Authority continued its public information campaign. Brochures on easements and the Authority were distributed to interested landowners. The Authority also held an informational meeting for the public on March 22, 2007.

Although no easements have been placed to date, Authority members and county staff continue to welcome any opportunities to meet with landowners and members of the community to discuss land preservation and to provide explanations of how conservation easements work.

For additional information on the Frederick County Conservation Easement Authority, visit <http://www.co.frederick.va.us/PlanningAndDevelopment/ConservationEasementAuthority/>.

#### *Virginia Outdoors Foundation Easement Program: Ongoing 2007*

The Virginia Outdoors Foundation (VOF) was created by the General Assembly in 1966. Its purpose is to promote the preservation of open space lands and to encourage private gifts of money, securities, land or other property to preserve the natural, scenic, historic, open-space and recreational areas of the Commonwealth. The primary mechanism for promoting this mission is the open space easement.

On June 6 and 7, VOF held a Policy and Easement Consideration Board meeting in Charlottesville. Potential easement applications were reviewed for dozens of counties across Virginia, including two easement proposals in Frederick County.

As of June 2007, 15 easements totaling approximately 2,600 acres have been donated to VOF by Winchester City-Frederick County residents. A list of these recorded easements is included in Table 5 below. Additional easements are currently being reviewed, such as a 151-acre lot in Frederick County and a 140-acre farm split between Frederick and Clarke counties.

**Table 5: VOF recorded easements in Frederick County and City of Winchester**

(Data provided by the Virginia Outdoors Foundation)

County	Donor	Recorded Date	Acreage
Frederick	Wells & Pollard families	11/4/1998	1,019.17
Frederick	Civil War Preservation Trust	11/9/2000	222.03
Frederick	Cedar Creek Battlefield Foundation	6/29/2001	135.08
Frederick	Cedar Creek Battlefield Foundation	6/29/2001	15.27
Frederick	Chapin family	9/13/2002	142.70
Frederick	Fort Collier Civil War Center, Inc.	9/13/2002	10.00
Frederick	National Trust for Historic Preservation...	10/29/2002	183.13
Frederick	Kernstown Battlefield Association, Inc.	3/28/2003	108.08



Winchester (City)	Kernstown Battlefield Association, Inc.	3/28/2003	115.2659988
Frederick	Kernstown Battlefield Association, Inc.	8/28/2003	62.20
Frederick	Good Earth Too Family Limited Partnership	10/4/2006	63.70
Frederick	Good Earth Too Family Limited Partnership	10/10/2006	55.00
Frederick	Green family	10/24/2006	186.00
Frederick	Potomac Appalachian Trail Club, Inc.	12/29/2006	257.33
Frederick	Potomac Appalachian Trail Club, Inc.	12/29/2006	42.70
<b>TOTAL</b>			<b>2,617.66</b>

For additional information on the Virginia Outdoors Foundation, visit its web site at <http://www.virginiaoutdoorsfoundation.org/>.

*Winchester Green Circle Project: Ongoing 2006*

The Winchester Green Circle Project is a walking and biking trail that, once completed, will encircle the city and provide safe alternative transportation methods for the community by connecting parks, neighborhoods, schools, and tourist attractions. Phase 1 of the Project was completed in 2005 by creating a 1-mile trail along Abrams Creek Wetland Preserve (Figure 14).

To date, the current focus of the Winchester Green Circle Project is the completion of Phase 1-A—Town Run Linear Park. The City of Winchester recently submitted a proposal to the Federal Highway Administration (FHWA) for funding and contracted with a consultant to begin work on this portion of the Green Circle. Town Run Linear Park is a proposed section of trail following Town Run from Pleasant Valley Road to Pall Mall Street to Cecil Street (dashed blue line, Figure 15). This trail would connect Old Town Winchester, Shenandoah University, Jim Barnett Park, Winchester-Frederick County Virginia Conventions and Visitors Bureau, Shawnee Springs Park as well as the future locations of the Shenandoah Valley Discovery Museum and History & Tourism Center.

Additionally, the City of Winchester recently completed the following projects funded by a VDOT Transportation Enhancement grant, which are critical to the success of the Phase 1-A route:

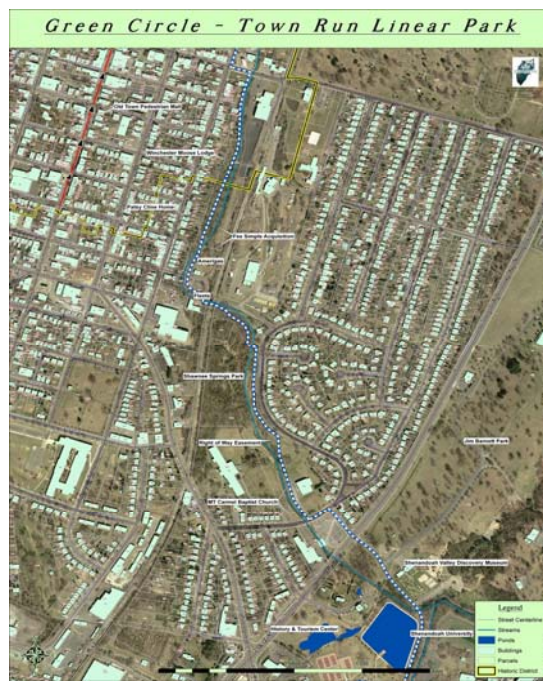
- Activation of a traffic and pedestrian signal;
  - Installation of crosswalks at Pleasant Valley Road and Hollingsworth-Lowry Drives
- Transportation.

For additional information on the Winchester Green Circle organization, visit <http://www.winchestergreencircle.com/>.



**Figure 14: Phase 1 of the Winchester Green Circle Project**





**Figure 15: Town Run Linear Park—proposed Phase 1-A trail of the Winchester Green Circle Project**

*Redbud Run Greenway Project: Ongoing 2007*

This project is a multifaceted initiative to implement the Conservation Reserve Enhancement Program (CREP) in the headwaters of the lower section of Redbud Run—a creek currently listed as a Virginia impaired water for excessive bacteria and inability to support life. A diverse group of partners are currently involved in the project including the City of Winchester, Shenandoah Valley Battlefields Foundation, Winchester Trout Unlimited, The Opequon Watershed, Inc. (TOW), and the Lord Fairfax Soil & Water Conservation District.

The Shenandoah Valley Battlefields Foundation and the Civil War Preservation Trust have permanently protected over 350 acres in the Redbud Run corridor, which covers over three miles to the confluence with Opequon Creek. In addition, negotiations with a developer were reached to lessen the impact on the stream through storm water best management practices (BMPs) and permanent land protection. Consequently, 30 acres and three-quarters of a mile of stream from a 155-acre tract were donated to the Virginia Department of Game and Inland Fisheries (DGIF) in late 2004.

To date, the local groups listed above have worked closely with DGIF and Frederick County on the development of a management plan for this preservation parcel located on the DGIF property and adjoining Civil War Preservation Trust property. These groups are currently working with the Frederick County Public Schools administration to involve students from nearby Millbrook High and Redbud Elementary in the greenway project. Students will be given the opportunity to participate and receive instruction from DGIF staff on trail design and construction, tree planting and control of invasive species, natural and historic interpretation, water quality monitoring, fish population surveys, and habitat assessment. Additionally, Winchester Trout Unlimited plans to sponsor a Trout in the Classroom program where students raise fingerlings to be released in Redbud Run.

The Opequon Watershed, Inc. (TOW) recently received grants from the Virginia Department of Forestry and the National Park Service-Rivers, Trails & Conservation Assistance Program (RTCA) for various projects associated with the development of the Redbud Run Greenway.

One of the projects involves developing a partnership between the major landowners and local organizations to create a plan connecting various parcels and assisting with individual initiatives.

The Civil War Preservation Trust (CWPT) is close to completing over five miles of multi-use interpretive trails on its 222 acre property. The trails will connect the parking area off Redbud Road with Millbrook High school on the opposite end of the property and will be fully accessible to the public. The Winchester Wheelmen are working with CWPT to develop single track biking trails to supplement the main trail. The project also has the ability to connect to other trail systems such as the Redbud Road Scenic Byway, Historic Milburn Road, Stephenson Depot area, and the Winchester Green Circle.

A kick-off meeting is scheduled for June 28 for the major landowners and organizations currently involved with the project. The purpose of the meeting is to introduce the potential partners and share information on current and long range plans for each owner and organization. The Redbud Run Greenway project is also serving as a case study for a state wide promotion of the Green Infrastructure approach. Funding from the Virginia Department of Forestry and technical assistance from the National Park Service are supporting this component of the project.

For more information on the Redbud Run Greenway Project, refer to the documentation located in Appendix P.

#### *Town Run Riparian Buffer Demonstration*

On March 31, VDEQ and TOW organized a community tree planting event where 450 trees and 150 shrubs were planted to create a 35-foot tree buffer on the upper Town Run. An extension of this project is the installation of an interpretive sign to specifically address the benefits of riparian buffers on air and water quality. The signage is to be located adjacent to the buffer area and in close proximity to Whittier Park where a future segment of the Winchester Green Circle biking and walking trail is planned.

For more information on the Town Run Riparian Buffer demonstration, refer to the documentation in Appendix P-3 or the news coverage in Appendix L-10.

#### *Natural Resources Advisory Board: Ongoing 2007*

The formation of a regional Natural Resources Advisory Board, which was originally called for by the Winchester-Frederick Community Consensus Coalition, is currently under review. Such an advisory board would be a critical source for information to address natural resource conservation at a variety of levels in the local decision making processes. Studies are presently underway in Frederick County to review ordinances and zoning in both the rural areas and the Urban Development Area (UDA). The Natural Resources Advisory Board could potentially serve as the mechanism to integrate strategies from the Clean-up Plan (a Total Maximum Daily Load Implementation Plan to reduce pollutants to meet water quality standards) and the basic principles of Green Infrastructure, into local ordinances and comprehensive plans.

An ordinance (Appendix P-4) to create this Advisory Board will have its first reading before the Winchester City Council in July of this year with formal approval anticipated in August. The creation of by-laws and approval of membership is expected to occur later this fall. Refer to the Natural Resources Advisory Board proposal for the City of Winchester, located in Appendix P-5.

#### *2007 Virginia Outdoors Plan*

The Virginia Outdoors Plan is the Commonwealth's official conservation, outdoor recreation, and open-space plan, which serves as a guide to all levels of government and the private sector in meeting the land conservation, outdoor recreation, and open-space needs of the state. To date, the Virginia Department of Conservation & Recreation (VDCR) is considering comments

received during 44 public meetings held in late 2006 throughout the state and revising the 2007 Virginia Outdoors Plan.

The 2007 edition of the Virginia Outdoors Plan will be the ninth produced in Virginia in accordance with § 10.1-200 of the Code of Virginia. In addition, the plan serves as a guidance document for the protection of lands through actions of the Virginia Land Conservation Foundation (VLCF).

Draft 2007 Virginia Outdoors Plan documents can be viewed by visiting the DCR Web site at [www.dcr.virginia.gov](http://www.dcr.virginia.gov). A draft *Regional Analysis and Recommendations* for the Northern Shenandoah Valley Planning District were made available to the public this year. To view the draft document, visit:

[http://www.dcr.virginia.gov/recreational\\_planning/documents/voppd07.pdf](http://www.dcr.virginia.gov/recreational_planning/documents/voppd07.pdf).

## Promote Mixed Use Development

### *City and County Comprehensive Plans*

Comprehensive plans for the City of Winchester and Frederick County include provisions for promoting mixed use and cluster development. The county Plan, required to be revised every four years, is scheduled to be reworked by the end of 2008. Once the Frederick County Planning and Development Department revises the land use section of its Comprehensive Plan, it will include the new Urban Development Area Study discussed below.

### *Frederick County Urban Development Area Study: Ongoing 2007*

The purpose of the Urban Development Area (UDA) Study is to address the needs of the urbanizing areas of Frederick County while assuring a sustainable community and maintaining a high quality of life for all Frederick County community members. The UDA policy promotes a new form of development—neighborhood mixed use urban community centers. Mixed use urban community centers is a new philosophy of development that creates neighborhoods that incorporate residential, retail, educational, and public uses; commercial services; the opportunity for employment; and institutional and recreational resources.

In January of this year, the Frederick County Planning Commission recommended approval of the Urban Development Area Study. On February 28, the Frederick County Board of Supervisors unanimously passed the Study, officially making it part of the county's Comprehensive Plan. Anticipated additions to the Plan include updated maps for new schools, roads, and other facilities.

For additional information on the Frederick County UDA study, visit

<http://www.co.frederick.va.us/PlanningAndDevelopment/UDA/Basic%20Information.htm>.

### *Crosspointe Mixed Use Project: Ongoing 2007*

Crosspointe Center is a mixed use project of retail and residential uses to be located outside of Winchester just east of I-81's intersection with VA-37 and Route 11. A master development plan for the project was approved by the Frederick County Board of Supervisors on April 25. The project will consist of 1,578 dwelling units and 960,000 square feet of commercial space. Refer to Appendix L-24 and L-28 for news coverage of the Crosspointe Center mixed use project.

### *Orrick Commons Mixed Use Project: Ongoing 2007*

Orrick Commons is a mixed use project of retail and residential uses to be located off of Senseny Road in Frederick County. The residential component is set to be age restricted.

Development of Orrick Commons is currently underway with construction to be completed in 2007.

### Promote Telecommuting

#### *Episodic Ozone Programs: Ozone Season 2007*

Each Air Quality Action Day Network member (i.e., business, government, education, media, and community) is encouraged to promote telecommuting, especially on Air Quality Action Days.

#### *NetTech Center of Winchester*

The NetTech Center of Winchester is a member of the Valley AIRCorps program and the Air Quality Action Day network. The center offers many amenities and technology services, including broadband internet connectivity; desktop video-conference services; affordable set-up; overflow capacity; real-time remote employee access; Smart Digital telephone system with voicemail; and access to fax machines, printers, copiers, and shredders.

The NetTech Center, in partnership with the U.S. General Services Administration (GSA), offered all federal managers, supervisors, and senior executives free use of the center for the rest of the fiscal year, ending on September 30, 2007. The purpose of this promotion was to help federal managers learn what telecommuting is and how it works to help them better manage distant workers.

The NetTech Center is also working with GSA to offer free center use to U.S. Department of Transportation (DOT) employees during the relocation and renovation of their Headquarters Office. Due to a lack of adequate parking at the new building, the NetTech Center is expecting several DOT employees to remain teleworking from the Center.

For more information on the NetTech Center, visit [www.nettechcenter.net/](http://www.nettechcenter.net/).

### **3. Open Burning Restrictions**

Establishing open burning restrictions for land clearing activities has the potential to reduce combustion sources in the emissions inventories. While this type of rule is sometimes difficult to enforce, the reduction of related fire hazards, along with the reduction of visible smoke and the resulting air-quality benefits were deemed important by the Northern Shenandoah Valley Task Force. This measure will be implemented by local ordinances.

#### **Control Strategies:**

#### *City and County Restrictions: Ozone Season 2007*

On May 1, a memorandum (Appendix J) regarding Frederick County local government actions on Air Quality Action Days was issued by the county administrator to all government agencies and offices. This memorandum specified the restrictions of any burning associated with county land clearing and construction projects on AQAD. Other AQAD actions specified in the memorandum included postponement of mowing and the use of oil-based paints and solvents, restrictions on engine idling, as well as the limitation of prolonged outdoor exertion by government employees.

Winchester City code prohibits open burning within city limits.



#### 4. Engine Idling Restrictions

Due in part to the nearby, heavily traveled I-81 corridor, restrictions for engine idling is another control strategy for the Northern Shenandoah Valley area. A large amount of idling emissions is generated from heavy-duty diesel vehicles that are parked at truck stops, rest areas, and to a lesser extent, distribution centers.

Control Strategies:

##### *City and County Restrictions on Air Quality Action Days: Ozone Season 2007*

On May 1, a memorandum (Appendix J) regarding local government actions on Air Quality Action Days was issued by the Frederick County administrator to all respective local government agencies and offices. This memorandum specified restrictions on engine idling of gasoline powered, publicly owned vehicles on Air Quality Action Days. Other AQAD actions specified in the memorandum included postponement of mowing and the use of oil-based paints and solvents, restrictions on any burning associated with county land clearing and construction, as well as the limitation of prolonged outdoor exertion by government employees.

##### *Clean Diesel Network*

The Clean Diesel Network (CDN) is a sixth dimension of the Air Quality Action Day Network developed in 2006. CDN was created due to the recent increase in truck traffic on Interstate-81. It is a voluntary program that is specific to all Winchester-Frederick County members of the mobile freight industry, including fleet and trucking companies, truck stops, and rest areas. By enrolling in the CDN, members agree to educate employees and/or customers of the benefits of reduced engine idling, particularly on ozone Action Days. When an Action Day is predicted, the designated Clean Air Coordinator will receive a press release emphasizing engine idling reduction as a step to reduce emissions for that day.

For more information on the Clean Diesel Network, visit the Valley AIRNow Web site at <http://www.valleyairnow.com/cleandieselnetwork.htm>.

##### *Frederick County Public Schools Bus Idling Policy*

Frederick County Public Schools continues to promote and enforce an idling policy for all County school buses. This idling policy can be found in the Frederick County Driver's Handbook—one that is issued to all bus drivers in the school system—and reads:

“Due to the increased health concerns relating to diesel emissions as well as rising fuel cost, Frederick County Public Schools has established the following anti idling policy.

- When performing pre-trip inspections, start the bus only at the point determined necessary to evaluate certain operational functions.
- Avoid all unnecessary idling while waiting at schools to load or unload students. This requirement applies to all a.m./p.m., kindergarten, tutor and activity runs, field trips, etc.
- Follow manufacturer's recommendations on limiting idling time to five minutes or less, with the exception of medical requirements (heat or a/c) of special needs passengers.
- If your bus is equipped with an engine block heater and has been plugged in overnight it is unnecessary to start it to warm it up.
- In extreme cold weather conditions, a “cold weather starting” procedure may be implemented for the purpose of ensuring the safety of students and will supersede the above requirements.”



*Idle Reduction Outreach Program: Ongoing 2007*

Valley AIRNow recently developed a program for area schools, day care centers, and businesses to educate parents, teachers, students, business leaders, and other community members on the health and environmental effects associated with vehicle engine idling. An idle-reduction street sign (Figure 8A) was created for businesses to display in parking lots or other areas with high instances of idling to encourage drivers to turn off their engines.

To date, a total of 74 signs have been distributed to a mixture of schools, day cares, and gas stations, with installation anticipated to be completed by September 2007.

## **5. School Bus/Heavy Duty Fleets Retrofits**

Retrofitting heavy duty diesel engines with emissions-control technologies, such as EGR systems or after-treatment devices, is an emissions-control measure that was addressed by the Northern Shenandoah Valley Task Force and completed as of December 2005. Eighteen Winchester City and 124 Frederick County schools buses were retrofitted with diesel oxidation catalysts. In addition, the ECM on all six late model school buses was reprogrammed to reduce NOx emissions. Refer to Appendix Q for an updated list of EPA Mid-Atlantic Clean Diesel projects, which includes Frederick County and City of Winchester school bus retrofit information.

## **6. Voluntary Industrial Reductions**

Although emissions-reduction benefits are sometimes difficult to quantify for voluntary industrial reductions, a campaign to promote voluntary measures by local industries is a reasonable and practical method to improve local air quality. Additionally, this strategy helps to increase awareness of the pollution problem and establish a relationship between local government and area industry.

Control Strategies:

*Valley AIRCorps Program: Ongoing 2007*

Valley AIRNow continues to recruit new members in a year-round effort for its Valley AIRCorps business outreach program. Upon enrollment in the program, companies designate a Clean Air Coordinator, who will receive email or fax notification of an Air Quality Action Day. The company can choose to formulate and personalize their AQAD program by encouraging alternative commute options, promoting telecommuting to those employees who qualify, regularly providing sponsorship for community events, regularly providing AQAD outreach assistance, lending use of dynamic message signs, and other emissions activities on AQAD. Companies have the flexibility to implement any creative policy that reduces emissions during ozone season. For more information on the AIRCorps program, refer to Page 20.

*Clean Diesel Network: Ongoing Development*

A sixth dimension of the Air Quality Action Day Network was developed in 2006. It is referred to as the Clean Diesel Network (CDN). The CDN was created due to the recent increase in traffic on Interstate-81. The Clean Diesel Network will be specific to all Winchester-Frederick County members of the freight industry, including fleet and trucking companies, truck stops, and rest areas. By enrolling in the CDN, members agree to educate employees and/or customers of better engine management practices (i.e., reduced idling), particularly on ozone Action Days. When an Action Day is predicted, the designated Clean Air Coordinator will receive a press release explaining the health risks involved and the steps each business can take to reduce emissions for that day. For more information on the Clean Diesel Network, refer to Page 21.

A. Control Measure	B. Summary Description of Measure	C. Program/Measure Status	D. Specific Implementation Date	E. VOC Reduction	F. NOx Reduction	G. Resources (FTE's, \$\$)	H. Additional Information
<b>27 Northern Shenandoah Valley, VA (Effective date of nonattainment designation deferred)</b>							
Ozone action days/public awareness -multiple activities	Comprehensive local ozone action days program - Program strategy includes a combination of individual measures	Program and individual measures have been fully implemented under the Valley AIRNOW program - <b>Completed</b>	Apr-05	0.3 TPD	0.02 TPD	70,000/year	Additional information on Valley AIRNOW can be found at <a href="http://www.valleyairnow.com">www.valleyairnow.com</a>
VMT Reduction programs - multiple activities	Implementation of a comprehensive local VMT reduction program	Program and individual measures have been fully implemented - <b>Completed</b>	Sep-05	0.15 TPD	0.3 TPD		See Appendix I-K in NSV Dec 2005 status report
Open burning restrictions	Open burning bans/restrictions during predicted high ozone days and /or during the ozone season	Both jurisdictions issued memorandums in June 2005 on restrictions on open burning during air quality action days. Replaced with mandatory state restriction by regulation in 20007 - <b>Completed</b>	Sep-05	0.28 TPD	0.12 TPD		See Appendix E in NSV Dec 2005 status report
Engine idling restrictions -truck/school bus	Restrictions on diesel idling of government vehicles	Both jurisdictions adopted policies regarding idling restrictions of government vehicles during action days - <b>Completed</b>	Sep-05	0	0.1 TPD		See Appendix L in NSV Dec 2005 status report
School bus/heavy duty diesel retrofit	Voluntary diesel retrofit program for school buses	A total of 142 school buses have been retrofitted with oxidation catalysts - <b>Completed</b>	Sep-05	0.002 TPD	0.001 TPD	475,000-DEQ	See Appendix L in NSV Dec 2005 status report
Voluntary industrial reductions	Voluntary reductions from local industries	Established the AIRCorps program to establish voluntary programs - to date 6 petroleum companies and 1 manufacturing company has joined this program - <b>Completed</b>	Spring 2005	NQ	NQ		See the Valley AIRNOW site for more information
Regional Reduction of NOx Emissions	Regional program to reduce ozone transport by reducing NOX emissions from power plants.	Implemented by state regulation during 2004 ozone season - <b>Completed</b>	May 31, 2004	NQ	NQ		113000 tons/per season reduced in VA between 2002 and 2006. Over 170,000 tps in VA and adjacent states
National Low Emission Vehicle Program	Requirement for the sale of low emissions vehicles	Program fully implemented by state regulation - <b>Completed</b>	1999	NQ	NQ		
RACT Controls -- VOC only, no NOx reductions	Expansion of existing source VOC control regulations and non-CTG RACT for major NOX sources	Implemented region-wide by state regulation - <b>Completed</b>	Nov-05	0.792 TPD	0		
Enhanced Ozone Forecasting tool	Preparing daily ozone forecasts during the ozone	Program fully implemented - <b>Completed</b>	May-05	NQ	NQ	70,000 & 1 FTE	
State Cutback Asphalt Regulation	Restriction on the use of cutback asphalt	Implemented region-wide by state regulation - <b>Completed</b>	Nov-05	0.001 TPD	0		
<b>Comments:</b>							



# **Ozone Early Action Plan**

## **Northern Shenandoah Valley**

### ***Northern Shenandoah Valley Ozone Early Action Area***

### ***State Air Quality & Program Update***

**June 30, 2007**



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## LIST OF APPENDICES

APPENDIX – Control Program and Measures Summary

# ***Northern Shenandoah Valley Ozone Early Action Plan State Air Quality & Program Update – June 30, 2007***

## **Introduction**

Provided in this report is a status of the state efforts to assist the Northern Shenandoah Valley (Winchester) Ozone Early Action Compact (EAC) Area in implementing the commitments contained in the Early Action Plan for the area. This plan was submitted as a State Implementation Plan (SIP) by the Virginia Department of Environmental Quality (VADEQ) on December 20, 2004 on behalf of the Commonwealth and the localities participating in the EAC process.

Since the formal submission of this plan, great strides have been made at the local, state, and regional levels to both implement control measures and produce emission reductions in ozone precursor pollutants. In turn, these controls and emission reductions have continued to translate into cleaner air for the Winchester area.

To demonstrate this progress in term of improved air quality, reduced emissions and pollutant transport, and the implementation of controls, the following discussed in the remainder of this report:

- Updated air quality improvement trends and observed reductions in regional ozone transport
- Updated 2006 emissions inventory demonstrating continued progress towards 2007 emissions reduction and attainment goals.
- Implementation of regional and state programs contributing to the EAP process.
- Summary and status of control measures implemented as part of the Winchester EAP.

## **Air Quality Update**

As the 2007 ozone season begins, air quality continues to improve in the Winchester area. This is demonstrated by the fact that the area has recorded only 3 exceedances of the 8-hour ozone standard since 2003. The improvement of air quality has continued in 2006 and early 2007 despite weather more conducive to ozone formation than in previous years. This trend in air quality improvement is documented below from highs recorded in the late 1990s. As a result, the Winchester area is now in compliance with the 8-hour ozone standard. One exceedance of the standard was recorded in the during the 2006 ozone season. However, the design value for Winchester has continued to drop to 71 parts per billion in 2006/2007. Please note that the 2007 ozone season data presented in this report is unofficial and only represents part of the current ozone season.

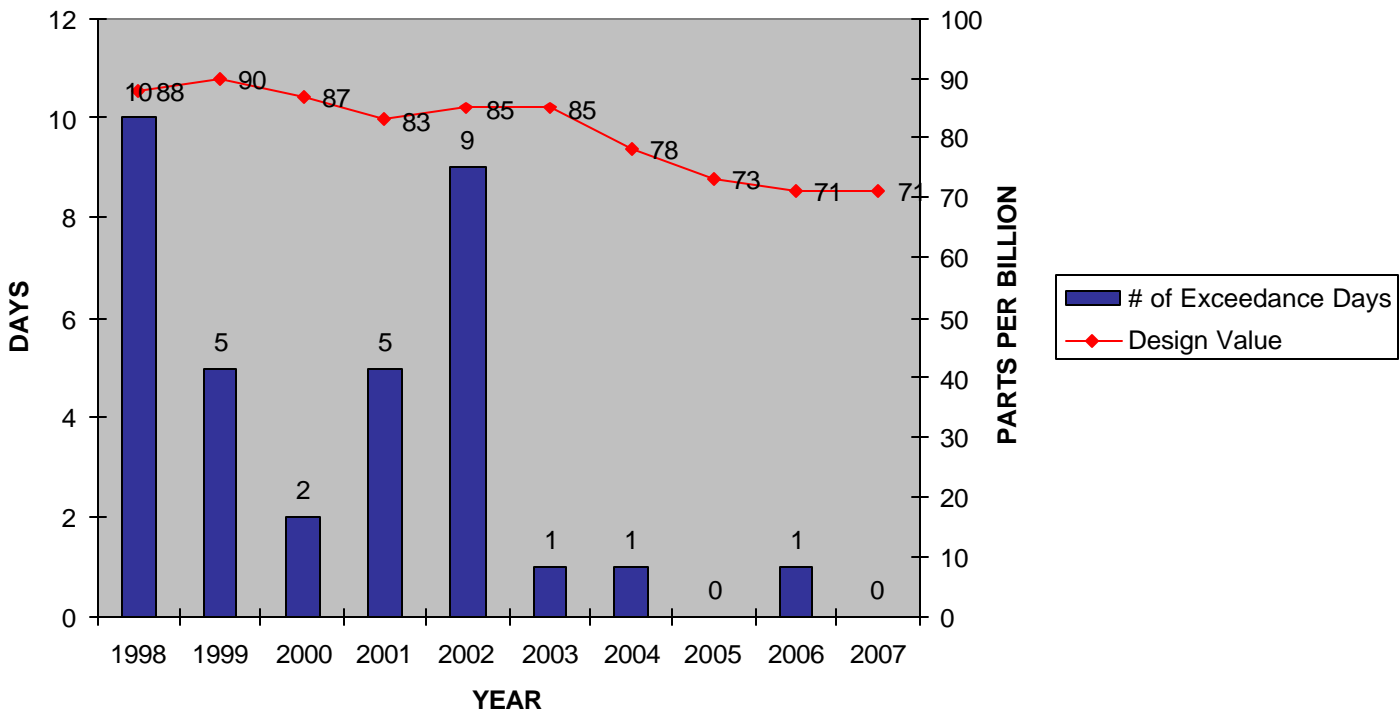


**Table 1 – Winchester Area Ozone Trends**

<b>YEAR</b>	<b># OF EXCEEDANCE</b>	<b>3-YEAR DESIGN VALUE</b>
1998	10	<b>88 Parts Per Billion (PPB)</b>
1999	5	<b>90 PPB</b>
2000	2	<b>87 PPB</b>
2001	5	<b>83 PPB</b>
2002	9	<b>85 PPB</b>
2003	1	<b>85 PPB</b>
2004	1	<b>78 PPB</b>
2005	0	<b>73 PPB</b>
2006	1	<b>71 PPB</b>
2007*	0*	<b>71 PPB*</b>

**\* Unofficial and partial season data for 2007**

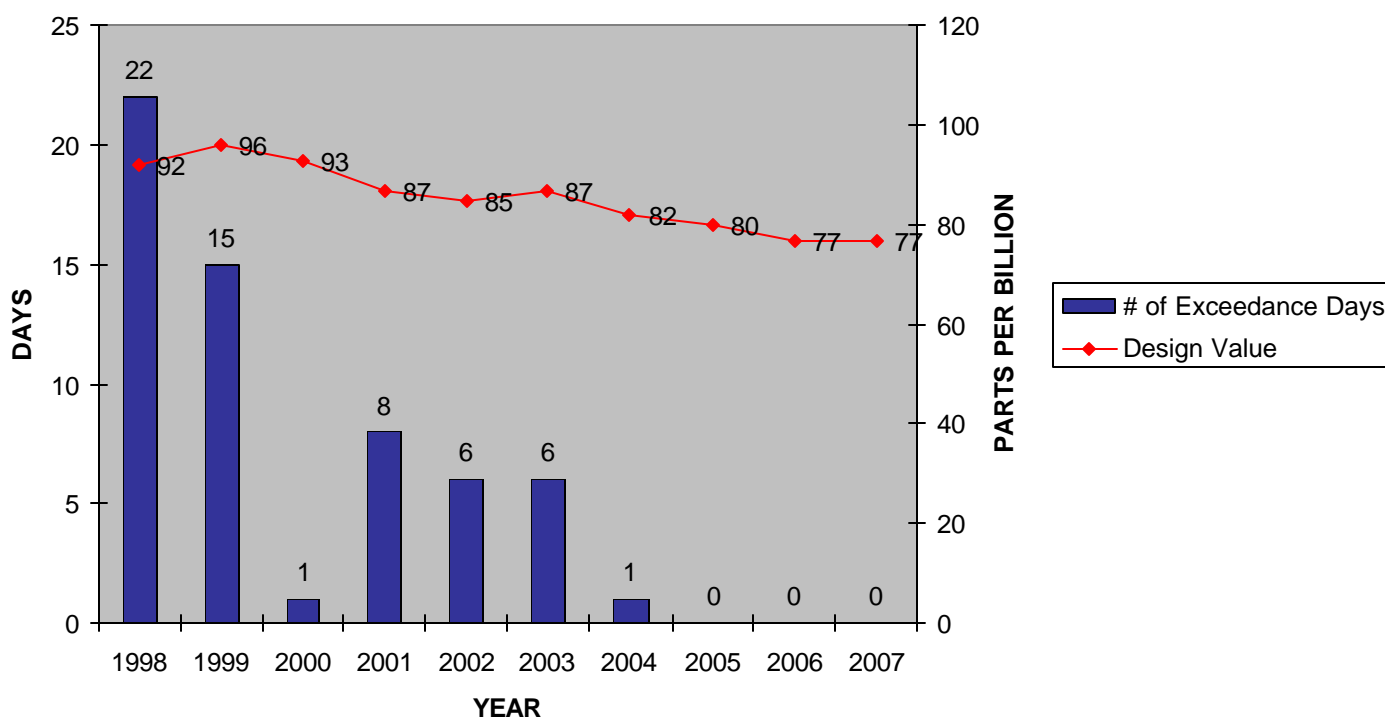
**Figure 1 – Winchester Area Ozone Trends**



Of equal or even more importance than the local ozone air quality improvement in the Winchester is the trends being observed in the reduction of ozone being transported in to Virginia and the EAC areas. Small areas like Roanoke and Winchester, with relatively small local ozone precursor pollutant emissions are significantly impacted by the regional pollutant load of ozone that is generated in upwind areas and transported into these areas by typical summer weather patterns.

To track and analyze the influence of transported ozone, Virginia has a long standing high-altitude monitor in the Shenandoah National Park (SNP) at Big Meadows. It is well accepted that high ozone values observed at this monitor is reflective of pollution being transported into Virginia from areas west of this monitoring station. As shown in the graph below, ozone air quality has also improved significantly at the SNP monitor. Again, the 2007 data is unofficial.

**Figure 2 – Big Meadow (SNP) Ozone Exceedance & Design Value Trends**



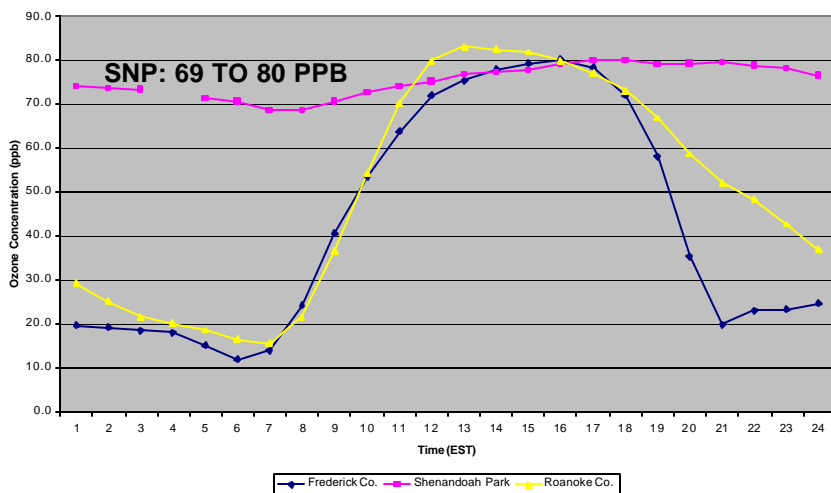
To investigate this reduction in transported pollution, the following analysis was performed. The table and charts presented below and on the next page show that the average ozone levels measured at Big Meadows during ozone exceedance days has dropped from 1998 to 2006 by about 12 ppb.

**Table 2 – Range of Big Meadows Hourly Average Concentrations**

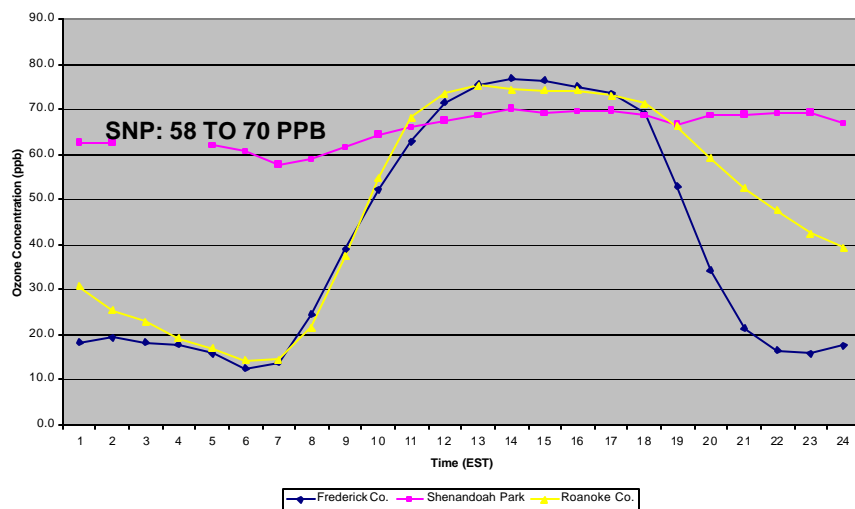
YEAR	AVERAGE CONCENTRATION RANGES
1998	69 TO 80 PPB
1999	65 TO 76 PPB
2000	67 TO 74 PPB
2001	68 TO 75 PPB
2002	58 TO 70 PPB
2003	70 TO 77 PPB
2004	56 TO 69 PPB
2005	54 TO 63 PPB
2006	60 TO 68 PPB

**Figure 3-5: Reduction in Ozone Transport (1998, 2002, & 2005)**

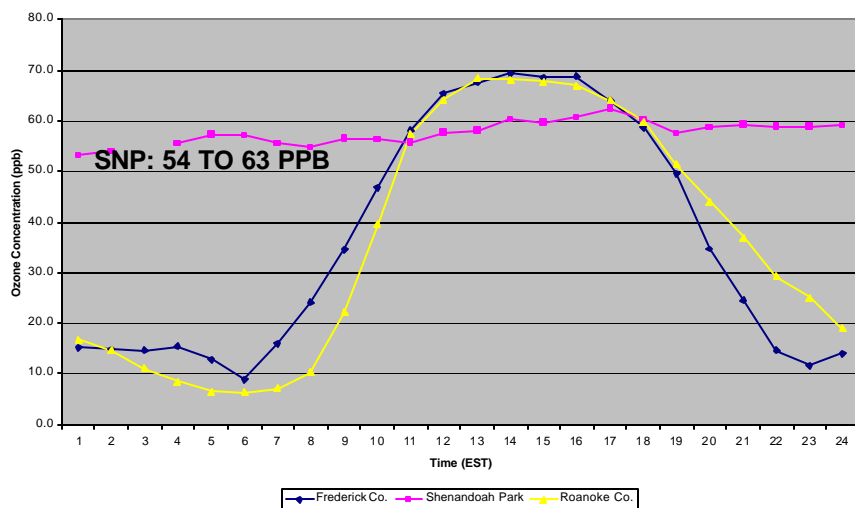
Hourly Ozone Concentration (1998 8-hr Exceedance Days)



Hourly Ozone Concentration (2002 8-hr Exceedance Days)



Hourly Ozone Concentration (2005 8-hr Exceedance Days)



This reduction in the regional ozone load is most likely due to the numerous control programs implemented to reduce ozone precursor emissions on the state and national levels. Most significant of these, the regional reduction of Oxides of Nitrogen (NO<sub>x</sub>) emissions from power plants.

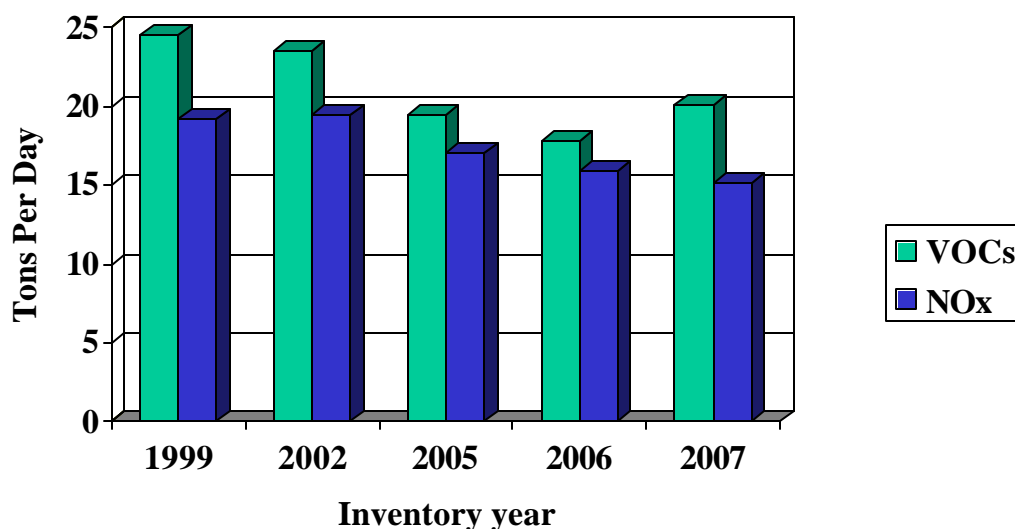
### **Emissions Inventory Update**

To demonstrate that the Winchester area is making good progress towards the emissions reductions committed to in the EAP, a preliminary 2006 emissions inventory for the area has been developed and is presented below along with a comparison to the 1999, 2002, 2005, and 2007 emissions inventories developed for the planning process. 2006 emissions data are not yet available.

**Table 3 – Winchester Area Emissions Inventories and Trends**

Source Category	1999 (Baseline)	2002 (Interim)	2005 (Previous Year)	2006 (Current Year)	2007 (Control Case)
<i>Volatile Organic Compounds (VOCs)</i>					
Point Sources	6.019	5.638	4.070	3.350	6.068
Area Sources	7.806	7.982	7.137	6.557	7.081
Non-road Sources	2.650	2.672	2.270	2.161	2.051
Mobile Sources	8.047	7.164	6.000	5.695	4.934
<b>Totals:</b>	<b>24.522</b>	<b>23.456</b>	<b>19.477</b>	<b>17.763</b>	<b>20.134</b>
<i>Oxides of Nitrogen (NO<sub>x</sub>)</i>					
Point Sources	0.745	0.934	0.970	0.810	1.075
Area Sources	2.526	2.603	1.412	1.501	2.612
Non-road Sources	1.910	1.942	1.770	1.709	1.647
Mobile Sources	15.090	14.029	12.950	11.907	9.952
<b>Totals:</b>	<b>19.271</b>	<b>19.508</b>	<b>17.102</b>	<b>15.927</b>	<b>15.186</b>

**Figure 4 – Winchester Area Emissions Inventory Trends**



The Winchester area is well on its way to achieving the emissions reductions needed to meet the attainment year (2007) goals. 2006 emissions levels are below the 2007 VOC emission target and just slightly above the NO<sub>x</sub> target.

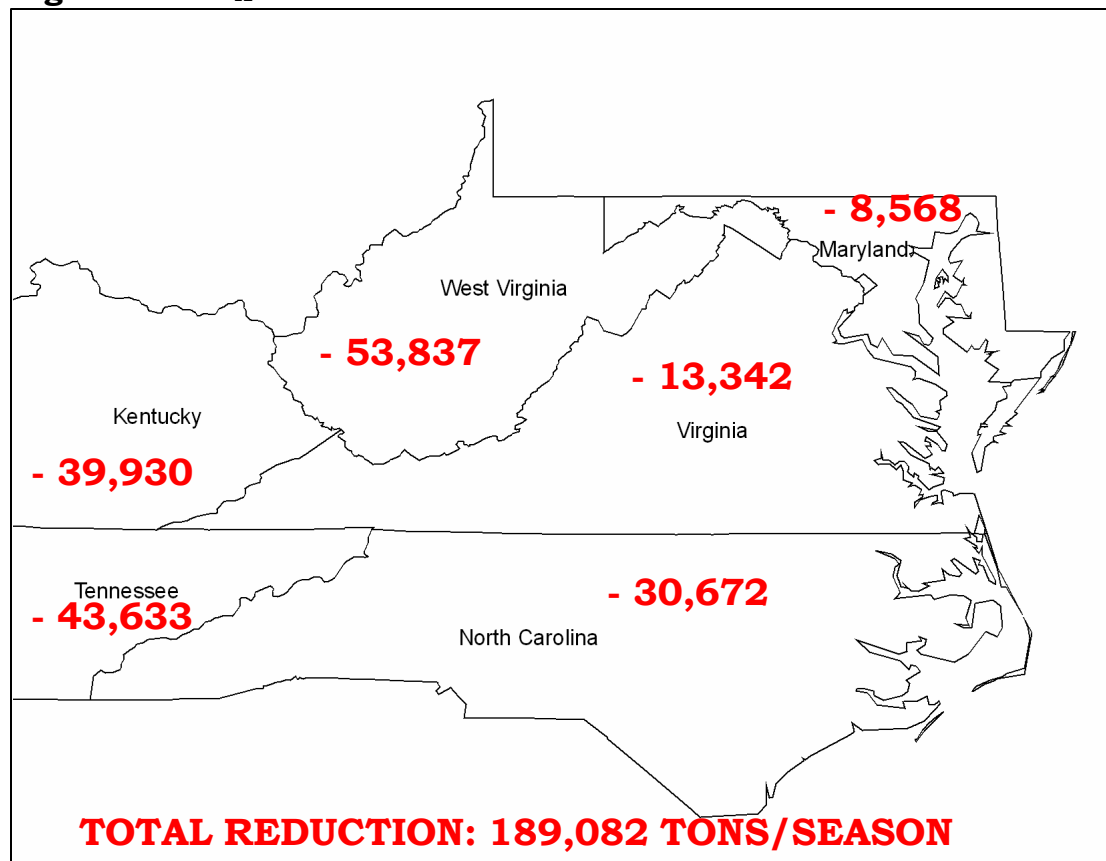
### **Regional/State Programs Update**

The Virginia Department of Environmental Quality (VADEQ) has implemented several control measures to assist the Winchester area in achieving its air quality goals.

#### ***1. Regional Reduction of NO<sub>x</sub> Emissions (SIP Call)***

The most significant of these programs has been the regional program to reduce NO<sub>x</sub> emissions from power plants and large industrial boilers. This regional program, commonly known as the “NO<sub>x</sub> SIP Call”, was established by the EPA to address the transport of ozone and precursor emissions in the eastern United States. Virginia, along with 22 other states became subject to this rule. Recent reductions in ozone have been linked to this program and are being driven by the significant reduction of NO<sub>x</sub> emissions in the area. An updated assessment of NO<sub>x</sub> emissions reductions has been performed for Virginia and surrounding states using data from the EPA Clean Air Markets Division. The results of this analysis are presented below:

**Figure 5 – NO<sub>x</sub> Emissions Reductions from 2002 to 2006**





As can be seen by this analysis, significant NO<sub>x</sub> emissions reductions are being achieved through the SIP Call program that is certainly contributing to the improvement in air quality being observed throughout the region and specifically in the EAC areas.

## **2. National Low Emissions Vehicle Program**

The National Low Emissions Vehicle (NLEV) program is a voluntary clean vehicle program established by the EPA through national regulation on December 16, 1997. Due to the voluntary nature of the program, it was contingent upon agreement by a number of Northeast states and the major automobile manufacturers. Virginia opted into this program for lower vehicle emissions standards, beginning with model year 1999 vehicles and subsequently adopted a state NLEV regulation, 9 VAC 5 Chapter 200, which became effective on April 14, 1999. This program along with the federal motor vehicle control programs, have and continue to provide substantial emissions reductions in Virginia that will assist areas like Winchester in meeting air quality standards and goals.

## **3. Existing Source Controls and NO<sub>x</sub> RACT**

To address local point source emissions, the state extended certain existing source and Reasonably Available Control Technology (RACT) regulations to the Winchester area to reduce the local contribution to ozone formation. These regulations were adopted by the Air Pollution Control Board in October 2003 and became effective on March 23, 2004. Compliance with these regulations was then required by November 15, 2005. These regulations mainly apply to two categories of sources which are described below.

A number of state regulations (Chapter 40) regarding existing sources of the Volatile Organic Compound (VOC) have been extended to the Winchester area. These regulations are as follows:

Article 5 - Synthesized Pharmaceutical Products Manufacturing Operations  
Article 6 - Rubber Tire Manufacturing Operations  
Article 11 - Petroleum Refinery Operations  
Article 24 - Solvent Metal Cleaning Operations Using Non-Halogenated Solvents  
Article 25 - Volatile Organic Compound Storage and transfer Operations  
Article 26 - Large Appliance Coating Application Systems  
Article 27 - Magnet Wire Coating Application Systems  
Article 28 - Automobile and light Duty Truck Coating Application Systems  
Article 29 - Can Coating Application Systems  
Article 30 - Metal Coil Coating Application Systems  
Article 31 - Paper and Fabric Coating Application Systems  
Article 32 - Vinyl Coating Application Systems  
Article 33 - Metal Furniture Coating Application Systems  
Article 34 - Miscellaneous Metal Parts and Products Coating Application Systems  
Article 35 - Flatwood Paneling Coating Application Systems  
Article 37 - Petroleum Liquid Storage and Transfer Operations  
Article 39 - Asphalt Paving Operations

Once these regulations became effective, the VADEQ regional office identified approximately 46 point sources in the Winchester area that were potentially subject to

one or more these regulations (not including repair shops). These sources were subsequently notified of the potential applicability of these regulations by letter dated February 26, 2004.

As a result of this notification process, most of these sources were determined to be exempt from these rules. The remaining sources have been determined to be in compliance or have permits which include VOC control requirements equal to or more stringent than the Chapter 40 requirements. Compliance with these regulations is specific to the individual process and regulation and mainly relies on VOC content limitations and/or emission reduction requirements. The estimate of about 0.8 tons per day of cumulative reductions from these requirements remains valid.

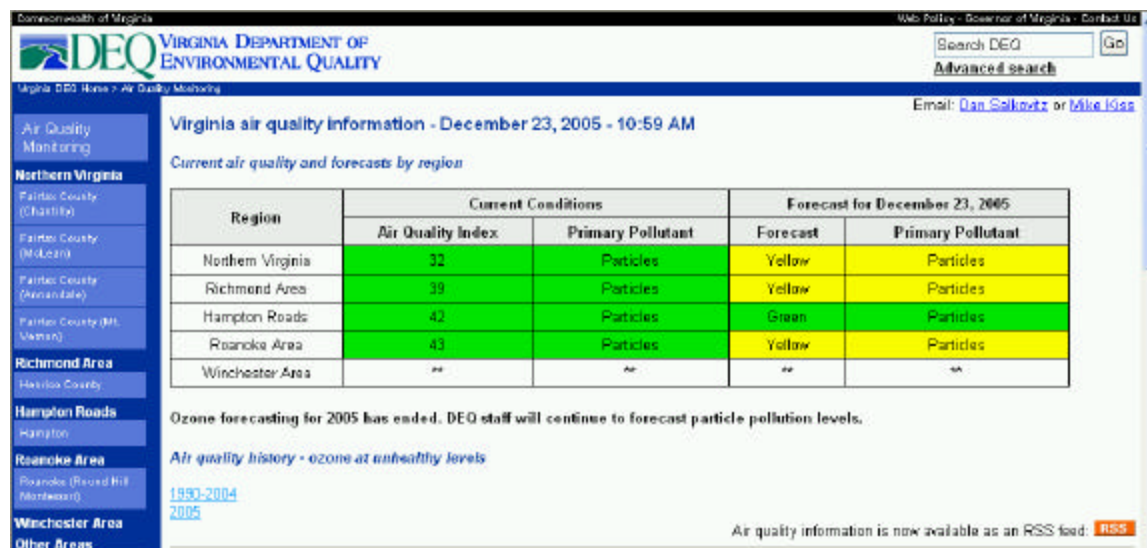
The second part of the control requirements involved case by case RACT determinations for major sources of NO<sub>x</sub>. One point source in the Winchester area was identified as being subject to this requirement which resulted in source specific RACT determination and permit that were submitted to the EPA and approved as separate SIP revisions as part of the overall EAP SIP. This RACT determination for the Global Chemstone Company did not require any additional controls and no reductions were included in the EAP.

#### ***4. Enhanced Ozone Forecasting tool for the Winchester Area***

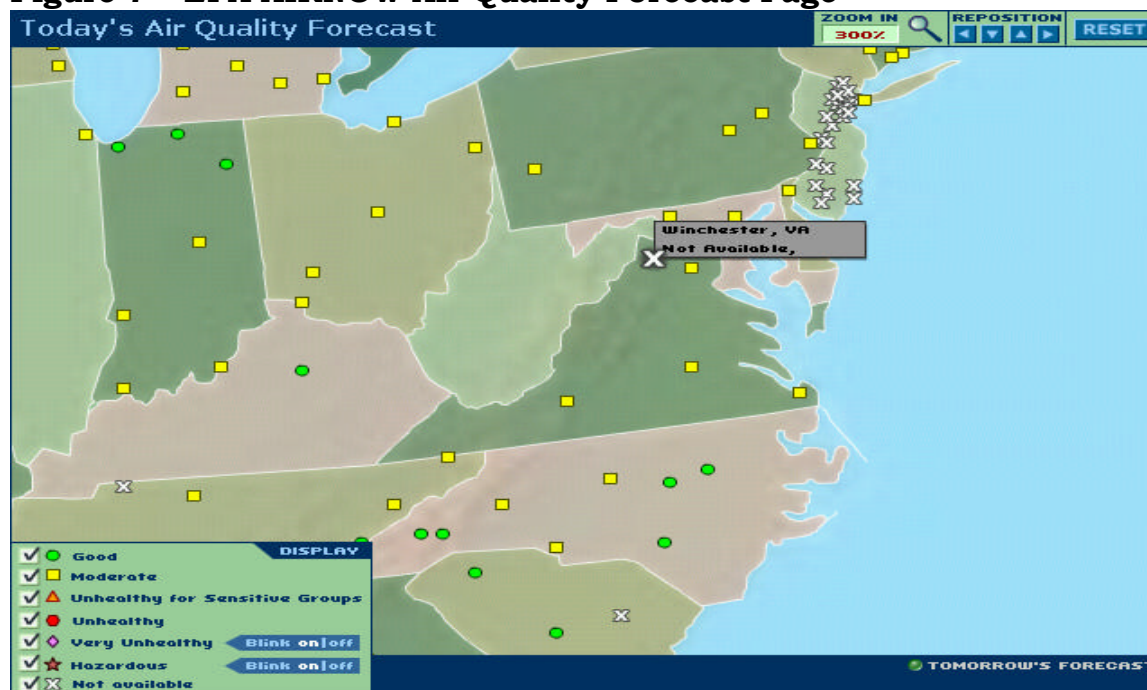
One of the main components of the local early action program is the establishment of an ozone action days program. This program requires a combination of mandatory and voluntary action by local governments and residents to reduce ozone precursor producing activities and emissions. In order to implement such a program, daily air quality forecasts are needed. To support this program, the VADEQ has completed the following actions to enhance the ozone forecast and health advisory program for the Winchester area:

- The VADEQ contracted with Sonoma Technologies Inc. to develop an enhanced ozone forecasting tool for various areas in Virginia, including the Winchester area. This work has been completed.
- An additional meteorologist has been hired to support the VADEQ air quality forecast and advisory program.
- A consultation process has been established with other local EAC areas in Maryland and West Virginia to discuss and issue cooperative daily forecasts.
- The Winchester area has been updated on the VADEQ air quality forecast webpage, and on the EPA's AIRNOW national forecast webpage to reflect these changes. These sites are shown in the figures below:

**Figure 6 – VADEQ Air Quality Forecast Page**



**Figure 7 – EPA AIRNOW Air Quality Forecast Page**



## 5. School Bus Emissions Control Retrofit Program

As part of an EPA/VADEQ funded and administered program, Frederick County and the City of Winchester have completed projects to retrofit a significant number of school buses with emission control technologies. The results of these projects are as follows:

Frederick County: 127 school buses retrofitted with diesel oxidation catalysts (DOC) at a total cost of \$163,000.

Winchester City: 8 buses retrofitted with DOC at a total cost of the project was \$8,800.

## **6. State Open Burning Regulation (New)**

On June 21, 2006 the State Air Pollution Control Board gave final approval to the expansion of a more restrictive seasonal open burning control program to the Winchester area. This more restrictive program became effective in October 2006.

### **Control Program and Measures Summary**

In general, the Winchester area and its state and federal partners have been very successful in implementing the commitments contained in the air quality plan. A summary of the control measures and estimated reductions in 2007 is presented below. No changes have occurred in the emission reduction estimates from the 2004 SIP. Appendix B of the 2004 SIP submission provides detailed descriptions of these measures and the methods used to calculate the predicted emission reductions.

#### ***Control Measures & Estimated Emissions Reductions (2007)***

<b>Emissions Control Measures</b>	<b>VOC (tpd)</b>	<b>NO<sub>x</sub> (tpd)</b>	<b>Modeled</b>
<b><i>State/Federal Area Source Controls</i></b>			
Architectural & Industrial Paints – Federal Rule (Federally Enforceable)	0.134	0.000	YES
Consumer Products – Federal Rule (Federally Enforceable)	0.056	0.000	YES
Metal Cleaning Solvents – Federal Rule (Federally Enforceable)	0.056	0.000	YES
Motor Vehicle Refinishing – Federal Rule (Federally Enforceable)	0.003	0.000	YES
Cutback Asphalt – State Rule (Federally Enforceable)	0.001	0.000	YES
<b>Subtotals:</b>	<b>0.250</b>	<b>0.000</b>	
<b><i>Federal Non-Road Source Controls</i></b>			
Small Gasoline Engine Standards – Federal Rule (Federally Enforceable)	0.812	0.027	YES
Diesel Engine Standards – Federal Rule (Federally Enforceable)	0.047	0.276	YES
Locomotive Engine Standards – Federal Rule (Federally Enforceable)	0.000	0.020	YES
Large Gasoline Engine Standards – Federal Rule (Federally Enforceable)	0.068	0.248	YES
Recreational Engine Standards – Federal Rule (Federally Enforceable)	0.004	0.000	YES
<b>Subtotals:</b>	<b>0.931</b>	<b>0.571</b>	
<b><i>Federal Mobile Source Controls</i></b>			

<b>Emissions Control Measures</b>	<b>VOC (tpd)</b>	<b>NO<sub>x</sub> (tpd)</b>	<b>Modeled</b>
Previous Motor Vehicle Standards – Federal Rule (Federally Enforceable)	2.675	3.202	YES
Tier 2 Vehicle Standards – Federal Rule (Federally Enforceable)	0.438	1.825	YES
Heavy Duty Diesel Standards – Federal Rule (Federally Enforceable)	0.001	0.111	YES
<b>Subtotals:</b>	<b>3.114</b>	<b>5.138</b>	
<b><i>State/Local Early Action Plan Controls</i></b>			
Existing Source RACT Controls – State Rule (Federally Enforceable)	0.792	0.000	YES
Ozone Action Days Program – State/Local (Mandatory/Voluntary)	0.302	0.015	YES
VMT Reduction – Local (Voluntary)	0.148	0.299	NO
Open Burning Restrictions (Mandatory/Voluntary)	0.122	0.280	NO
School Bus Retrofit Program (Mandatory)	0.002	0.001	NO
Engine Idling Restrictions (Mandatory/Voluntary)	0.000	0.102	NO
<b>Subtotals:</b>	<b>1.366</b>	<b>0.697</b>	
<b>TOTALS:</b>	<b>5.661</b>	<b>6.406</b>	

More details on local implementation efforts can be found in this the local status report and the implementation summary page.